

Exclusive Show Coverage: Amiga '90, COMDEX, & WOCA



Amazing

COMPUTING™

Your Original AMIGA® Monthly Resource

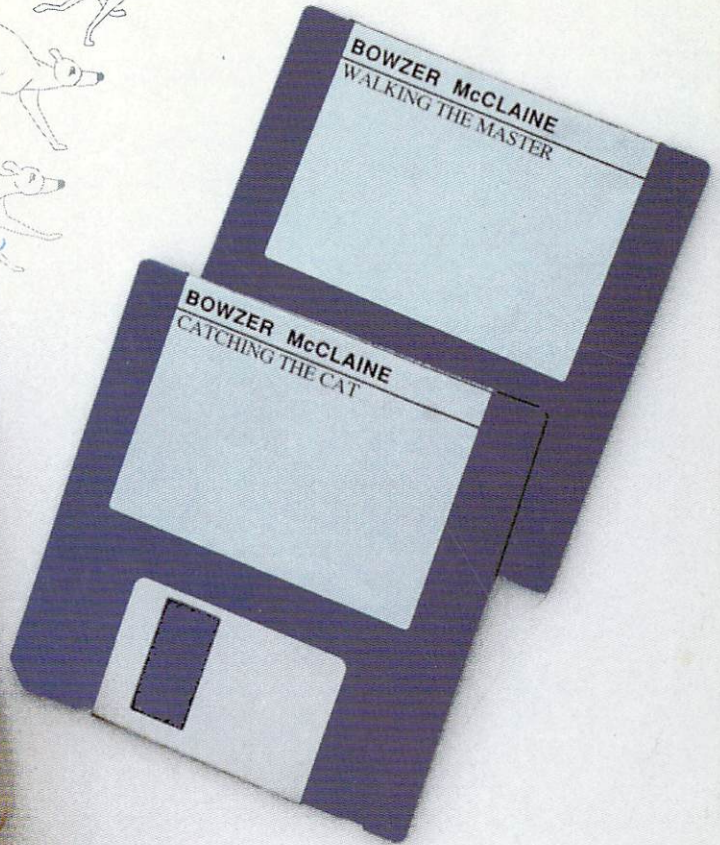
For The Commodore

AMIGA®

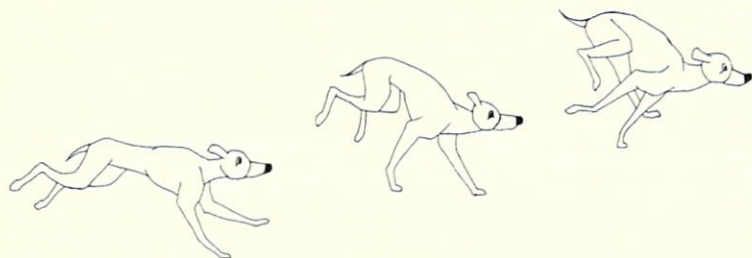
Volume 6 No. 1 January 1991
US \$3.95 Canada \$4.95

AMIGA ANIMATION— EASIER THAN EVER!

- ▶ Disney's Animation Studio
- ▶ Cartoon Animation:
A 3-part Course
- ▶ The Amiga In Court
- ▶ Plus—
22 AMIGA Animation
Packages Showcased!



CONTENTS



IN THIS ISSUE



On The Road22

Amiga '90

COMDEX

*The World of
Commodore Amiga*

AC has traveled the globe in search of new Amiga products. From the newest in presentation and 3-D products to the first public showing of CDTV, AC was there. Read the exclusive coverage of Cologne, Germany's Amiga '90, COMDEX in Las Vegas, Nevada and The World Of Commodore Amiga in Toronto, Ontario, Canada.

Electronic Color Splitter26

by Greg Epley

An inexpensive way to grab quality images off video sources.

Cover by
Ernest P. Viveiros, Sr.

REVIEWS

SketchMaster 8

by Ernest P. Viveiros, Jr.

A sleek, high-performance graphics tablet.

Professional Draw 2.010

R. Shamms Mortier

"There's nothing like it on the market at the moment."

Spell-A-Fari18

by Jeff James

Three jungle animals can help your youngster learn to spell.



Patty the Parrot

PROGRAMMING

Programming in AmigaBASIC62

by Mike Morrison

This month, Mike takes a look at recursion.

ZoomBox75

by John Leonard

Add a zoom box to an Intuition window.

DEPARTMENTS

Feedback..... 4

Editorial Content 6

List of Advertisers.....80

Public Domain Software93

And Furthermore...96

COLUMNS

New Products And Other Neat Stuff14

by John Rezendes
Some new products
this month include
QuickWrite

by New Horizons,
PowerMonger by
Electronic Arts,
and *Vistapro* by
Virtual Reality
Laboratories.



The Art Department Professional

New! Medley20

by Phil Saunders
AC's new music column begins by discussing MIDI.

Bug Bytes37

by John Steiner
A few problems with PageStream 2.0. Plus,
Quarterback Tools is now shipping.

PD Serendipity86

by Aimée B. Abren
Now you can change from PAL to NTSC
easily with NTSC-PAL. Plus, updates from
Fred Fish disks 381-390.

C Notes From The C Group67

by Stephen Kemp
This month, a pop quiz to test your C
programming knowledge.

Roomers69

by The Bandito
It's time again for The Bandito's fearless
predictions for the New Year.

Snapshot71

by R. Bradley Andrews
It's up to you to save the wizard in Electronic Arts'
The Immortal.

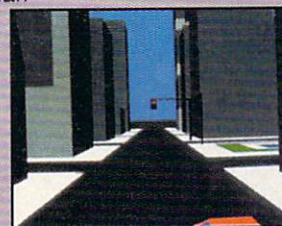
ANIMATION

The Animation Studio39

by Frank McMahon
Disney's classic approach in a character
animation program.

Forensic Animation42

by Andrew Lichtman
The Amiga helps
out in the
courtroom.



Cartoon Animation48

by D. L. Richardson
Back to the basics in animation.

Animation Chart55

Twenty-two animation packages and features.

Memory & Animation60

by Chris Boyce
Even 512K users can animate!

Animation Extras

by David Duberman

Animation with 3-D Professional51

Progressive Peripherals & Software

Animation Station52

Progressive Peripherals & Software

Elan Performer & Animation53

Elan Design

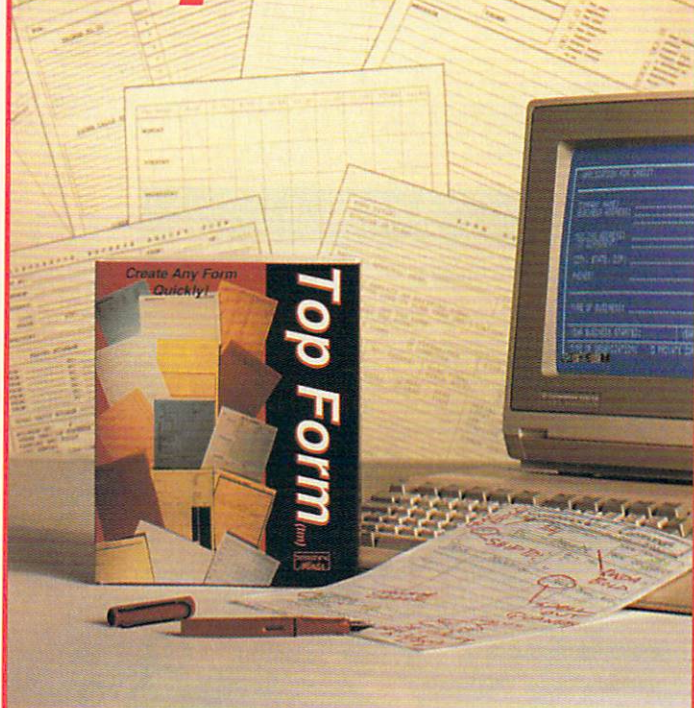
Animation with the Sculpt Family ...54

Byte by Byte

Turbo Silver Animation59

Impulse, Inc.

Top Formtm



Create Custom Forms Quickly

Are you tired of manually creating your forms, typing and drawing by hand and then spending hundreds of dollars on typesetting and printing?

If your answer is 'Yes', then Top Formtm is for you!

- Variable Size Forms
- Cut, Copy, Paste
- View Before Printing
- Custom Printer Utility
- Sort & Justify Blocks
- Print Perfect Forms, With No "Text Or Line Jaggies"
- Create Boxes, Grids, & Lines Quickly And Effortlessly
- Supports NTSC, PAL, Or Custom Screen Automatically
- Merge External Database Files For 'Batch' Forms
- Fully Programmable Math Macros For Each Form
- Most Printers Supported, Including Postscript & HP
- Hundreds Of Pre-designed Forms And Applications
- Mouse & Keyboard Operation
- Import ASCII Text Files
- Book Marks & Special Macros
- Comprehensive Manual
- Supports Any Printer Attribute



only \$89⁰⁰

Call Or Write For More Information
Designing Minds, Inc.
3006 North Main, Logan, Utah 84321 (801) 753-4947
No Copy Protection, Installs On Any Hard Disk

Amazing^{AMIGA} COMPUTINGTM

Amazing Computing For The Commodore AMIGATM

ADMINISTRATION

Publisher: Joyce Hicks
Assistant Publisher: Robert J. Hicks
Admin. Assistant: Alisa Hammond
Circulation Manager: Doris Gamble
Asst. Circulation: Traci Desmarais
Corporate Trainer: Virginia Terry Hicks
Traffic Manager: Robert Gamble
International Coordinator: Donna Viveiros
Marketing Manager: Ernest P. Viveiros Sr.
Marketing Associate: Greg Young
Programming Artist: E. Paul

EDITORIAL

Managing Editor: Don Hicks
Associate Editor: Elizabeth Fedorzyn
Hardware Editor: Ernest P. Viveiros Sr.
Technical Editor: J. Michael Morrison
Technical Associate: Aimée B. Abren
Copy Editor: John Rezendes
Video Consultant: Frank McMahon
Art Director: William Fries
Photographer: Paul Michael
Illustrator: Brian Fox
Graphic Designer: Kim Kerrigan
Research & Editorial Support: Alisa Hammond
Production Assistant: Melissa-Mae Lavoie

ADVERTISING SALES

Advertising Manager: Donna Marie

1-508-678-4200
1-800-345-3360
FAX 1-508-675-6002

SPECIAL THANKS TO:

Buddy Terrell & Byrd Press
Bob at Riverside Art, Ltd.
Swansea One Hour Photo
Pride Offset, Warwick, RI
Printers' Service & Supply, Inc.
Mach 1 Photo

Amazing Computing For The Commodore AmigaTM (ISSN 1053-4547) is published monthly by PIM Publications, Inc., Currant Road, P.O. Box 869, Fall River, MA 02722-0869.

Subscriptions in the U.S., 12 issues for \$24.00; in Canada & Mexico surface, \$34.00; foreign surface for \$44.00.

Second-Class Postage paid at Fall River, MA 02722 and additional mailing offices.

POSTMASTER: Send address changes to PIM Publications Inc., P.O. Box 869, Fall River, MA 02722-0869. Printed in the U.S.A. Copyright© December 1990 by PIM Publications, Inc. All rights reserved.

First Class or Air Mail rates available upon request. PIM Publications, Inc. maintains the right to refuse any advertising.

PIM Publications Inc. is not obligated to return unsolicited materials. All requested returns must be received with a Self Addressed Stamped Mailer.

Send article submissions in both manuscript and disk format with your name, address, telephone, and Social Security Number on each to the Associate Editor. Requests for Author's Guides should be directed to the address listed above.

AMIGATM is a registered trademark of Commodore-Amiga, Inc.

AMAZING DEALERS

The following **Amazing Dealers** carry *Amazing Computing™*, your resource for information on the Amiga™, and *AC's Guide To The Commodore Amiga*, the total Amiga product guide. If you are not an Amazing Dealer, but would like to become one, please call:

1-508-678-4200

[illegible]



Feedback

THE ADVANTAGE

I would like to know if Amazing has done a review of the spreadsheet called 'The Advantage' by Gold Disk? If a review has been done then please tell me the volume and issue number, if not, would you consider doing one? A comparative review of spreadsheets including The Advantage would be most helpful.

Sincerely,
Bob Lockie
Burlington, Ontario

—Gold Disk released *The Advantage 1.1* in September and we hope to do a review of the package in the near future.—Ed.

FURTHER FLICKER FACTS 1-3

#1 It appears from Mr. Masters' letter in the October, 1990 issue, that there is still quite a bit of confusion regarding interlace and "flicker" as seen on standard television and our Amigas.

Mr. Masters asserts that some colors flicker faster than others, that 1/30-second is faster than human perception of flicker, and that flicker is not inherent in the NTSC standard. These statements are incorrect. He also states that "someone with access to the proper test equipment should investigate the problem." There's nothing to investigate because there is no problem.

Interlace is simply an electronic method to paint a CRT image. "Flicker" is human perception of this method, and it varies with a staggering number of variables. The most critical one is time. Anything slower than 60 times per second will be perceived by most of us as flicker under some conditions. The most common occurrence is when an image consists of horizontal sections only one scan-line high. In Amiga interlace modes (and in stan-

dard U.S. TV), these sections will occur only 30 times a second, well into the threshold of human perception of flicker. They don't occur fast enough to fool the brain into thinking that they are continuous, because standard phosphors are not sufficient to keep the pixel illuminated until the next pass of the beam. We usually don't see TV flicker because most images are large blobs of color, such that all elements cover many scan-lines, not just one. Check out the weatherman's symbols, though: you'll see interlace flicker, just like on your Amiga.

But let's say you have created one-pixel-high graphics on your Amiga screen. They are probably flickering, but there are many variables as to how BADLY. Flicker gets worse the brighter the image is, the higher the contrast ratio between your highlight and background colors, the more peripheral vision you use in looking at the tube, the more green you have in the image, and also varies between individuals.

Flicker WILL OCCUR in interlace modes. But in your own work, you have control over the severity. Lower the contrast of the image by raising the background color from black, and lower the intensity of your highlight color. Yes the image tends to "wash out" compared to vivid, colorful graphics you may be used to. But notice how much easier it is to look at the image for a long period of time. Avoid bright green lines: the eye is most sensitive to this color, and can be overwhelmed by high levels of it, causing you to sense flicker sooner. You can often choose to double up on pixels; if you've made a one-pixel-thick horizontal line, put another one right above or below it. If your contrast is low between these lines and the color above and below it, flicker will nearly disappear.

The Amiga was designed with interlace modes to remain compatible with NTSC devices, such as VCR's and TV's. I,

for one, am glad to have this compatibility, and am willing to work around flicker when it occurs. While there will always be fools who will design programs with hires interlace screens with thin, bright green lines on black backgrounds, more and more smart authors are choosing wisely. Kudos go to Elan's Performer and Impulse's Imagine for their intelligent choice of screen colors.

Interlace is an important part of our machine, but flicker can be fought.

Karl Sparklin
Dayton, OH

#2 Comments on Jerry Masters' comments in the October 1990 issue, regarding interlace flicker: I have done some investigation as to its cause, and have come to the conclusion that it is nowhere near the standard NTSC interlace screen. I put the interlace screen on, typed a lot of sevens on the screen, and looked at it through the blades of a 8" fan on which I had installed a speed control. When the correct speed was found, the alternate fields could be observed, and the result was that the one field lost the horizontal top of the sevens, and likewise shortened the other letters or numbers on that field. That, and the fact that the aspect ratio of the screen is changed, makes me wonder what Commodore had in mind in building in such a nonstandard screen in an otherwise excellent computer.

That it should be possible to change the screen is evidenced by the use of a terminal program which was included with the purchase of the Aprtek 2400 baud modem; this was called "Handshake", developed by Eric Haberkellner, who lives in Canada. One of the menu selections is Interface, with either half screen or full screen interlace selection.

Full screen selection gives what appears to be very close to NTSC interlace, and remains after exiting the program. Giving this screen the fan test above showed the alternate fields had the same size letters and numbers, but they were being moved vertically the distance of one interlace, still not NTSC standard, but much closer, and with reduced flicker. Several programs were tried using this screen such as IFF pictures, CanDo, and others, and the screen stayed in this interlace mode until rebooting. If a picture was done in interlace mode, that's the way it appeared; going on to another picture that was not interlaced, came back to the "Handshake" interlace.

Regarding Jerry Master's conclusion on the sync source in the Amiga, he is right about the sync coming from Agnus, but there is also a Csync line (Composite sync) coming out of Agnus which feeds Denise; so apparently Agnus is the culprit, developing these off standard sync signals. There are IC's on the market which develop NTSC standard sync signals, such as RCA's 22402; something like this should have been built in to provide the compatible screen required.

There must be a way of programming the computer to produce better interlace. I hope someone with a lot more savvy than I will come up with it!

Very truly yours,
John A. Wheaton
Syosset, NY

#3 I have a few comments to make in regards to Mr. Masters' letter (Re: Interlace Flicker, in the October 1990 issue.

First, with regards to the apparent difference between the primary colors. I can think of two possible reasons for a noticeable difference in perceptible flicker between the three primaries.

The first of these involves the actual phosphors used in the monitor. Should the green phosphor have a shorter persistence than those of red and blue, the green would appear to flicker more intensely than red or blue.

The other possible explanation involves a property of the eye itself. The eye is most sensitive to light in the yellow-green portion of the spectrum. It seems reasonable to assume, therefore, that a small change of intensity in the green would be seen more easily than the same intensity change in the other two primaries. I remember reports from the late 70's (when calculators used LED and plasma displays) that blue had been determined

to be the most difficult display to read, while green was the easiest—red was the most common due to its low cost.

Concerning whether NTSC broadcasts are subject to flicker, I have yet to see anything transmitted which had a horizontal pattern matched to the scan lines of a TV. Most images I have examined (even text patterns) tend to "fuzz" over the scanline boundary, and are thereby displayed in each "half frame".

The following BASIC program can be used to demonstrate the major difference between the interlace and non-interlace modes. On an interlaced screen, the program opens a window into which it writes a series of horizontal lines. The left side consists of alternating single-pixel lines. The right side has alternating double-pixel lines. Lastly, the program opens a non-interlaced screen/window and writes alternating single-pixel lines. If this screen is dragged down to reveal the interlaced screen, it can be seen that the non-interlaced single-pixel lines look the same as the interlaced double-pixel lines. A fairly good example that the moiré is always in interlace mode—a non-interlace image is produced by having the hardware repeat the same image on both "half frames."

```
' Interlace Flicker Demonstration
' Dennis Lee Bieber Sept. 30, 1990
' This program opens a hi-res/interlaced
' screen with two windows. The first window
' contains alternating lines, the second
' has doubled alternating lines (each
' doubled line being equivalent to a single
' line in a non-interlaced screen).
```

```
SCREEN 1, 640, 400, 2, 4
WINDOW 2, "Alternating Doubled",
(2,10) - (630,385),16, 1
```

```
COLOR 1,2
CLS
L2 = WINDOW(2)
L1 = L2 / 2
FOR i = 1 TO WINDOW(3) STEP 2
  LINE (1,i) - (L1,i)
NEXT i
```

```
FOR i = 1 TO WINDOW(3) STEP 4
  LINE (L1,i) - (L2,i)
  LINE (L1,i+1) - (L2,i+1)
NEXT i
```

```
' for comparison purposes, open a non-
' interlaced screen, and put up alternating
' lines
```

```
SCREEN 2, 640, 200, 2, 2
WINDOW 4, "Noninterlaced, Alternating (drag
screen down)",
(2,10) - (620,185), 0, 2
COLOR 1,2
CLS
FOR i = 1 TO WINDOW(3) STEP 2
  LINE (1,i) - (WINDOW(2),i)
NEXT i
```

Sincerely,
Dennis Lee Bieber
Sunnyvale, CA

PC-SAS FOR THE AMIGA

My wife works in the medical field using an IBM PS/2 (gasp!) to run a statistical package called 'PC-SAS', put out by the SAS Institute in Cary, NC. These are the same people who recently took over the C Compiler from Lattice and are publishing the 'SAS/C Compiler for AmigaDos', version 5.1, as of this writing. For those who are not familiar with this package, its statistical capabilities are phenomenal. It is widely used in the medical field and for government applications. It is also available to run on mainframes, minicomputers, and workstations. Advertisements in "PC Week" provide a full description of its capabilities.

I called them to see if they were going to port 'PC-SAS' to the Amiga and was told that they currently had no plans to do so. However, they said that the best way to get those plans changed was for many (read as 'hundreds and thousands of') Amiga enthusiasts to write to them imploring them to put out an Amiga version.

I personally feel that the SAS Institute is missing the boat by not porting this package to the Amiga. Their knowledge of the Amiga operating system which allows them to support the SAS/C Compiler should make the porting a feasible task for them to accomplish. This would go a long way toward closing the gap between applications that run on the IBM PC and the Amiga.

I encourage all of your readers to write to their marketing department and request that they port 'PC-SAS' to the Amiga. Their address is:

SAS Institute, Inc.
SAS Campus Drive
Cary, NC 27513-2414
Attn: Marketing Department

Sincerely,
Gerald Haworth
Millersville, Md.

All letters are subject to editing. Questions or comments should be sent to:

Amazing Computing
P.O. Box 869
Fall River, MA 02722-0869
Attn.: Feedback

Readers whose letters are published will receive five public domain disks free of charge.

EDITORIAL CONTENT

Traveling Editor: A story of there and back again

ONE OF MY FAVORITE books has always been Tolkien's *The Hobbit*. Tolkien captured the essence of travel. Through the escapades and escapes of Mr. Baggins, we are treated to the broadening of his wisdom. We begin to see how each adventure strengthens his character and hardens his resolve. With each new person he meets, Mr. Baggins becomes more understanding of his world. After the number of trade shows involving the Amiga in which I have either been a participant or an observer lately, I am beginning to feel a great deal like Mr. Baggins.

Last month, we brought you our coverage of the World Of Commodore and AmiEXPO ("Twin Peaks", December 1990) that were held simultaneously from October 5 to 7 in Chicago and Anaheim respectively. Home from these shows, we completed both the December issue of *Amazing Computing* and the largest periodical ever for the Amiga, our Fall/Winter edition of *AC's Guide To The Commodore Amiga*. With the *Guide* and *AC* safely at press, it was time to grab a plane, but this would be a much different journey.

My travels started with a long overnight flight to Köln, Germany for Amiga '90. In just a few short days, I was introduced to the mania that the Amiga has spawned in Europe. Distributors told me that the Amiga 500 was sold out in some areas through Christmas. I watched while over 60,000 attendees descended on the two large halls of Amiga '90 over its four-day run.

My limited German was just enough to keep me out of trouble so most of my conversations with the German people were through their knowledge of English. I was amazed with the way they loved the Amiga. It was as if we had taken the enthusiasm of an American Amiga user group and applied it to an entire continent.

The second thing that struck me about Amiga '90 was the large number of North American Amiga developers that attended. Either working in their own booths or with their distributors, developers demonstrated their products and listened to the concerns and needs of their European customers.

From this enormous demonstration of Amiga enthusiasm, I dropped directly into the area where IBM is king and Apple is considered a pretender to the throne, Comdex. Comdex Fall '90 was held in Las Vegas and attracted over 126,000 attendees during its five-day run.

Commodore placed their booth in the newly completed Sands Exhibition Center. But, even with a half-million square feet of exhibition space, the Sands was away from the main segment of Comdex and, apparently, so was the Amiga. Although Commodore demonstrated the Amiga from its newest Unix release to the magic of Digital Creations' DCTV, and NewTek, with their booth at the Sands, wowed growing crowds with the wizardry of the Video Toaster, the main contingent of Comdex could not or would not listen.

"Windows" was shouted and "multi-media" was whispered throughout the event, but few of the thousands of attendees understood that the Amiga was there first and still remains in the forefront. From the euphoric European exhibition, I fell to the world of Windows and more Windows. I wondered, amidst all the talk of windows, whether any of them could see.

From Comdex, it was only one short holiday and another short week to The World Of Commodore Amiga in Toronto, Canada. The Hunter Group had promised a large and exciting show. They delivered. With the first public showing of CDTV and the work of exhibitors such as Walt Disney Computer Software, WOCA not only attracted the largest number of attendees at any

Amiga event in North America this year (over 32,000), but sold more Amiga computers at any one time than I have ever seen before. One dealer had sold seventy-two machines by the second day of the event.

However, this is not about how many units were sold. The people who came to The World Of Commodore Amiga believed in the Amiga. Maybe, since there is only one show in the area each year, WOCA gets people excited about what the Amiga can do for them. Whatever the reason, they believe the Amiga is the best computer for their needs.

Whether I was talking to a young German at Amiga '90, viewing a demonstration by an Amiga developer at Comdex, or witnessing a family carrying their first Amiga home from The World Of Commodore Amiga, the same truth came through. These people believe that the Amiga is the best. They prove it by their actions, their dedication, and their purchases. They support the Amiga because it is superior for their needs.

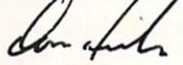
Mr. Baggins found that his world was much larger and a great deal more complex than he ever believed it could be. He responded by retiring from traveling, staying at home, and discussing his adventures.

I have found the world to be a bit smaller. Although there are differences in the way we use the Amiga and differences in what we expect to do with an Amiga, the Amiga is a common thread that unites people of different languages, cultures, and attitudes. The Amiga, more than any other computer platform currently available, excites people into being creative.

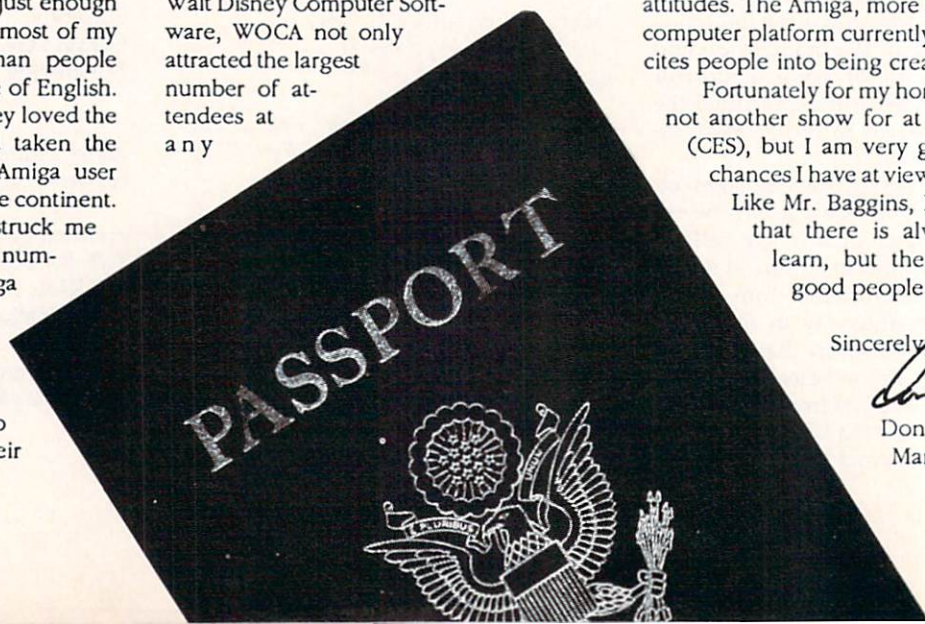
Fortunately for my home life, there is not another show for at least a month (CES), but I am very grateful for the chances I have at viewing our world.

Like Mr. Baggins, I have learned that there is always more to learn, but there are always good people to teach me.

Sincerely,



Don Hicks
Managing Editor



DATA EXPLOSION!

GVP storage solutions
keep up with you

IMPACT
Series II

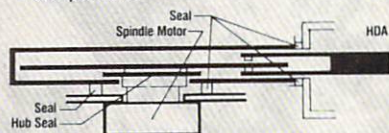
Your Amiga® is doing more today than anyone would have guessed a few short years ago. Color graphics. Scanned images. Multi-media. Video Imaging. You need storage solutions that can keep up with these data-hungry revolutions in computing. Without a revolutionary hassle.

No matter what your mass storage needs, GVP has it! Complete plug-and-play storage solutions for your Amiga, from 50MB to 600MB. From Hard-Disk-Cards to Removable-Cartridge Hard Disk to Rewritable Optical to Streaming Tape.

If you use your Amiga for Graphics, DTP, Image Filing, Database Management, Video Imaging, Multi-Media, CAD/CAM, System-Wide Backup, then you need our removable-media storage solutions...

1 SII-R5500—Ricoh 50MB Removable Hard Disk Drive: Features you cannot ignore.

- Increased storage capacity: 48MB formatted under Amiga DOS per cartridge.
- Sealed cartridge air filtration system ensures data integrity and keeps media free from damaging dust particles for fail-safe reliability, unlike the competition.



- Impressive 25ms average access time.
- Mounts internal in Amiga 2000® 5.25" drive bay or external with GVP's IMPACT XC (see photo below).

IMPACT XC ▶



- Made by Ricoh of Japan, a quality, well-known manufacturer of precision, high-technology products.

2 SII-M09200E/600—Ricoh 600MB Magneto-Optical Drive: Backed by Ricoh's expertise in optical disk technology.

- 600MB formatted capacity per cartridge (300MB per side).
- State-of-the-art Rewritable Magneto-Optical drive using high-tech laser technology, and ISO format compatible.
- Latest Magneto-Optical technology enables cartridges to be over-written many times, offering unlimited storage capacity.
- 66.7ms average access time.

3 IMPACT WT-150—WangTek 150MB Streaming Tape Backup System: Together with GVP's TAPESTORE™ software, makes backups simple and fast.

- High performance with backup speeds of over 6MB per minute when using GVP TAPESTORE software.
- Uses industry standard DC6150 cartridges with 150MB formatted capacity.
- Mounts internal in Amiga 2000 5.25" drive bay or external using GVP's IMPACT XC (see photo, left).

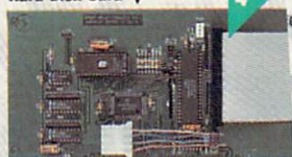


SII-MO9200E/600
shown here in
vertical position.

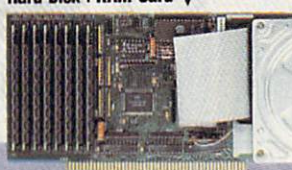
- Comes standard with GVP's comprehensive TAPESTORE backup and restore software package.
- TAPESTORE also sold separately.

4 GVP's New FAAASTROM™ SCSI driver and installation software comes standard with the Series II™ SCSI Controllers' giving ultimate removable media drive support. When purchasing GVP mass storage removable devices, be sure to ask for a GVP Series II SCSI Controller! Ask for the complete kit.

Hard-Disk-Card ▼



Hard-Disk+RAM-Card ▼



Educational pricing program now available.

TAPESTORE, FAAASTROM, Series II, and GVP are trademarks of Great Valley Products Inc. Amiga and Amiga 2000 are registered trademarks of Commodore-Amiga, Inc.

GVP

Available on GSA schedule through
SMS Data Products Group, Inc.
GSA #6500K-90-AGS-5242
1-800-331-1767 Ext. 5227

GREAT VALLEY PRODUCTS INC.
600 Clark Avenue, King of Prussia, PA 19406

For more information, or for nearest dealer, call today. Dealer inquiries welcome.

Tel. (215) 337-8770 • FAX (215) 337-9922

Circle 123 on Reader Service card.

Back thru the drawing board...

The SketchMaster Graphics Tablet

by Ernest P. Viveiros, Jr.

WHAT COMES TO MIND when you think "graphics tablet" for the Amiga? It's likely you think high prices, software incompatibilities, big clunky set-ups, overly complicated installation, expensive accessories...but great performance! In the past, the drawbacks have far outweighed the benefits of a graphics tablet. Enter the new generation of graphics tablets—the SketchMaster series graphics tablet from Dakota Corporation.

The SketchMaster is a sleek, high-performance graphics tablet which runs on almost any A500, A2000, A2500, or A3000. (The SketchMaster will also run on the A1000, however it requires a special adapter available from Dakota.) The SketchMaster supports both a stylus and a cursor (both are included) and includes all the necessary cables and software.

Additionally, the SketchMaster is the only Amiga graphics tablet that does not require a power supply. It's powered directly through the RS232C serial port, which helps to eliminate the clutter of big, clunky power supplies and their cables.

Once you have properly set up and connected the SketchMaster hardware to the Amiga (A 1-minute operation), it's time to install the software. Software installation is easy! Just pop in the installation disk and click the install icon. Two files—a control panel and a driver—will be copied to your SYS: Preferences and Utilities drawers respectively. To use the tablet, just open the Preferences drawer and run the SMControl application. From here you can turn the tablet on or off, change the size of the working area, and even select which transducer (stylus or cursor) to use.

Software compatibility is excellent. The SketchMaster should work with any mouse-driven application (the driver generates simulated mouse events to the operating system). The tablet responds smoothly and accurately, even when tracing though material 1/2-inch thick.

So what do you really get for your money? The SketchMaster system includes the tablet, pen-stylus, 4-button cursor, interface cable, 9 to 25-pin adapter, software, and manual. The tablet is available in two sizes: 11.7" x 11.7", and 12" x 18". The SketchMaster is also covered by a 5-year limited warranty. Not to mention the great performance you'll get! Now think "SketchMaster graphics tablet". What comes to mind? Reasonable prices, great software compatibility, sleek organized set-ups, easy installation, and no accessories to buy...it's all in the box.

•AC•

SketchMaster Graphics Tablet

11.7" x 11.7": \$449.00

12" x 18": \$699.00

Dakota Corporation

55 Heritage Avenue

Portsmouth, NH 03801

(603) 427-0100

Inquiry #231

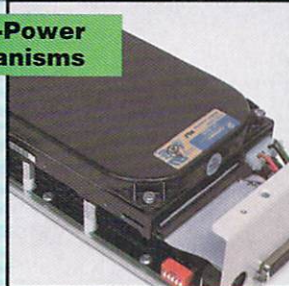


The SketchMaster is the only Amiga graphics tablet that does not require a power supply. It's powered directly through the RS232C serial port.

INTRODUCING THE
EXCITING NEW

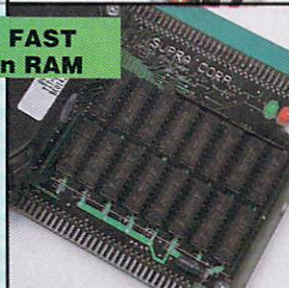
SupraDrive™ 500XP

Fast, Micro-Power Drive Mechanisms



- **Micro-Power Drives**
No fans or external power required, extra rugged
- **Autobooting SCSI Interface**
A2000 performance with no DMA problems
- **Optional Dedicated External Power**

1/2 - 8MB FAST Expansion RAM



- **1/2, 1, or 2MB RAM**
On-Board with 256K x 4 DRAM
- **2, 4, or 8MB RAM**
with Add-On RAM Board using 1MB x 4 DRAM

SCSI Port & Game Switch



- **Amiga Bus Pass-Through**
- **External SCSI port**
allows up to 7 SCSI devices
- **Game Switch**
lets you turn drive off and leave RAM enabled

Easy-to-Access Option Switches



- **Autoboot ON-OFF Switch**
- **SCSI ID Selector**
- **RAM Test Mode**

THE ULTIMATE AMIGA® 500 PERIPHERAL!

With a SupraDrive 500XP™, your computing life will change forever.

You'll be able to use software that your computer simply couldn't run before, including paint, digitizing, and animation programs that need more RAM. You'll spend more time using your computer and less time waiting for it to transfer files and load programs, because the SupraDrive 500XP transfers data up to 40 times faster than floppy disk drives.

You can easily add up to 8MB RAM, additional Amiga bus peripherals (like digitizers), or SCSI peripherals (like removable media, tape backups, or add-on hard drives). And if you need help, you can count on Supra's knowledgeable, friendly technical support staff and one year warranty.

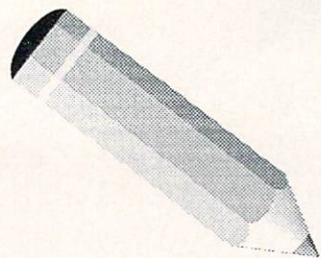
Available at your local dealer, or call:

Supra Corporation
1-800-727-8772

Circle 119 on Reader Service card.

SupraDrive 500XP is a trademark of Supra Corporation.
Amiga is a registered trademark of Commodore-Amiga, Inc.

503-967-9075, 1133 Commercial Way, Albany, OR 97321, USA



Professional Draw 2.0

by R. Shamms Mortier

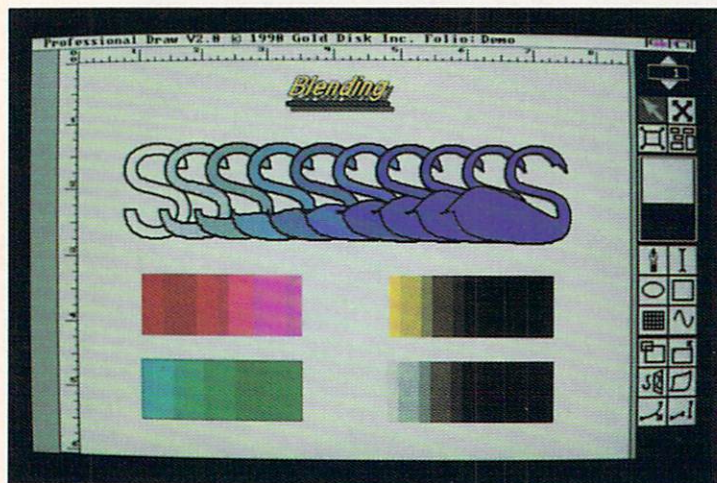
Although other vector drawing programs are promised to Amiga desktop publishing enthusiasts, Professional Draw, at the moment, is the only vector drawing software available for the Amiga. A vector drawing program has several advantages for users involved in desktop publishing. It is not "bitmap-based", but "remembers" the quality of lines and their "direction" (or vectors), not the position of each pixel on the screen (as does a bitmapped program like Electronic Art's DPaintIII). One asset of a vector over a bitmapped method is that storage space is minimized, as it takes far less room to

store vectored data than bitmapped information. In the desktop publishing world, where the printers to which you address your data reformat the output in ways that screen graphics are hard-pressed to match, vector drawings can print without the ever-present "jaggies". No matter how much the drawing is enlarged or reduced, a vector graphic maintains its quality of line. Printers, especially PostScript printers, are capable of much finer resolutions than are the finest resolution computer screens.

Professional Draw 2.0 addresses dot-matrix, HP-Laser, and PostScript printers,

although only the latter will give you the results promised. Unlike its main Amiga competition, Soft Logik's Pagestream, Pro Draw's output is disappointing when directed to anything but a PostScript-quality printer. It was designed to be the drawing partner to Gold Disk's Professional Page, and saves files in formats that are easily imported into Pro Page and the other desktop publishing wares that Gold Disk produces.

With Pro Draw, you can set up the page sizes either by choosing from a menu of the recognized traditional output sizes (from a standard 8 1/2" x 11" page to the A3 to B5 options that are familiar to users of plotters), or you may input your own custom dimensions. There is also a separate menu that details Pro Draw's preferred PostScript output specs, including full color separation, crop marks, and color "bleeds". All of these attributes are what one would expect from a professional desktop publishing package, and this is accomplished within the page format requester. All of your Pro Draw efforts can be saved to disk and loaded in again with a standard Amiga load/save requester, leaving your work open for future editing.



Pro Draw 2.0 gives you the opportunity to blend colors.

Tools Of The Trade

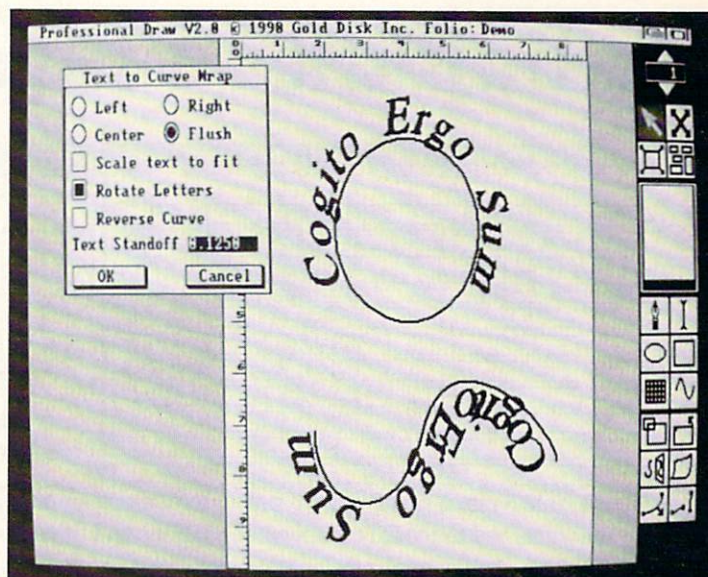
Bezier Curves are Pro Draw's main mode of operation. Straight lines are just versions of a Bezier Curve, as are other lines. As an artist, I must admit that Bezier Curves are not my favorite way to draw. I can work with them much better now than I could when Pro Draw first introduced the concept, but that's after quite a bit of practice. I would enjoy Pro Draw more if the Bezier Curve attribute were hidden in a more traditional drawing tool or a series of tools. Adjusting the curves and their placement gets in the way of the creative process as far as I am concerned, although I'm sure they make more sense to an engineering designer. The same tutorial that taught Bezier Curves to Amiga users in Pro Draw 1.0 is still used as the major tutorial in this upgraded version, and I still find it rather cumbersome. Since the Bezier Curves have survived the 2.0 upgrade unchanged, and offer no promise of being revised or seriously altered in the upgrades to come, I'll have to resign myself to their use for the present. They do offer two advantages over other methods of drawing curves: they are usually drawn as smoother curves between two points, and they leave fewer initial data points on the screen.

Once curves of any kind are drawn, Pro Draw lets you reshape them to your heart's desire by allowing you to assign more data points at any place on the curve, and then move either the whole curve or a selected part to a new position. Very fine detail can be added by zooming in on the picture until only one element of it fills the entire screen. Once drawn, any element may be moved about the page with ease, and closed areas may be filled with color or a variety of gray-scaled tints.

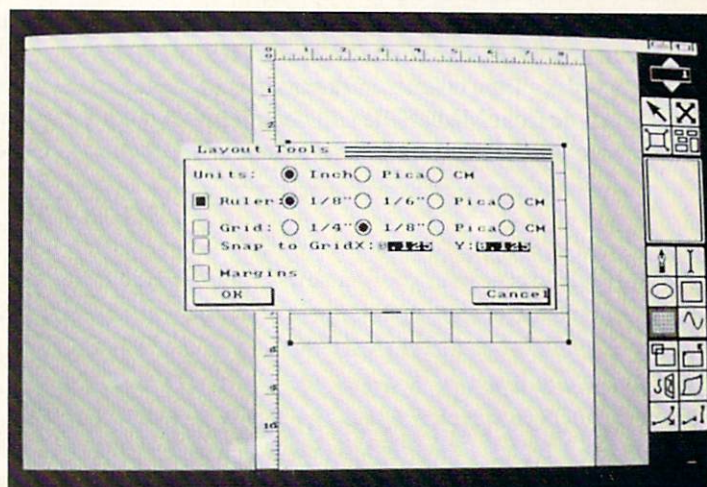
New "Blend" Option

Some of the finer attributes you may be working with in Pro Draw will not be visible on the Amiga's screen itself due to the limitations of the Amiga screen as

The ability of Pro Draw 2.0 to fix text to any curve.



The grid lines can be set to any increment horizontally or vertically.



compared with the finer resolution of a printing device. Pro Draw 2.0 gives you the opportunity to blend colors behind an area of text, although the full import of this operation can only be appreciated in the final printout.

The method for obtaining these blended areas is quite simple once you get the hang of it. First, two cloned areas (boxes) are filled with separate colors (magenta and blue, for example). Then both areas are "selected". While selected, "blend" is chosen from the "special" menu.

in which there are four "Blend" options: Linear, Inverse, Sinusoidal, and Cubic. "Linear" blending transforms an object evenly, like a evenly graduated screen tint. You can input the exact number of steps in which this is to occur. "Inverse" blends are transitions that take place in an increasingly wider number of steps. "Sinusoidal" blends the colors in a sine-curve relationship, while "Cubic" places a darker toned section in the middle of two lighter ones. Since the output can address a top-of-the-line color printer as well as a black

MediaPhile® Video Editing System

from \$320 Complete

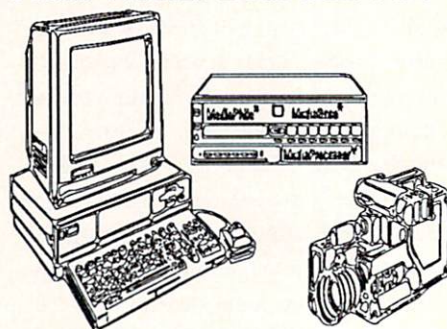
MediaEditor 2.0 (edit list) - No Stops Active, Put Deck In Play-Pause			MC	
TITLE	IN	OUT	0:00:00:00	
<input type="checkbox"/> Joni steals home on a wild pitch	00:14:20:05	00:14:31:17	◀◀ ◯ ▶▶	
<input type="checkbox"/> Bad Guys score two run, tripple	00:45:01:00	00:46:49:00		
<input type="checkbox"/> Jim ties the score in the eighth	01:02:45:13	01:04:07:00	◀◀ ▶▶ ▶▶	
<input type="checkbox"/> Rich wins the game in the ninth	01:01:16:23	01:19:00:05		
<input checked="" type="checkbox"/> Score 2-2	01:03:55:00	01:03:59:12	◻ ◻	
<input type="checkbox"/> Score 1-1	00:46:31:21	00:46:35:00		
<input type="checkbox"/> Score 1-0	00:14:01:00	00:14:09:29	MEDIAPHILE	
<input type="checkbox"/> Score 1-2	00:46:42:28	00:46:49:00		
<input type="checkbox"/> Score 3-2	01:16:53:04	01:17:05:00		
<input type="checkbox"/>				
<input type="checkbox"/>				

- Infrared Control
- Remote pause and S Control
- Two Video Deck Counter Inputs
- Edit Decision List Software
- Animation and Title Recording From Within Your Software

The MediaPhile System gives you the power to perform automatic edits from players to a recorder, and to record computer animations and titles from within popular Commodore-Amiga programs automatically. All under computer control.

Mouse and keyboard control makes editing easy. Select any deck function including freeze-frame, single frame step, and digital effects from the screen control pad or keyboard. Video editing features include adjustable pre-roll for smooth, professional looking insert and assembly edits, a preview mode with a five-second freeze-frame at IN and OUT points, A/B-roll and accurate tape positioning.

Edit with any infrared controlled VHS, SVHS, 8mm, Hi-8mm or Beta video deck or camcorder. Tape counter information is brought into the Amiga from Sony "remote" jacks, or from MediaPhile edit control kits that are easy to install in just about any video deck. Please specify your deck manufacturer and model number.



Interactive MicroSystems, Inc.
9 Red Roof Lane, Salem N.H. 03079
Telephone: (603) 898-3545

Circle 109 on Reader Service card.

and white PostScript device, it presents an infinite number of design possibilities. "Blends" are a new addition to the program, yet are not listed in the index for reference. The Blending tutorial says "see the chapter on Blends", but there is no chapter named "Blends". Perhaps this was an oversight that will require a more thorough tutorial in the future.

The "Fill" option can be a bit confusing at first. I had to turn "fill" off for the previous object before getting it to react—a design feature that needs more tweaking. Make sure "fill" is not on when you initially design an object, and then you can choose a fill color and turn it on afterwards. Filling with the black and white option gives the best-looking screen, though users with color printers will want some color preview. The object has to be boxed in by using the marquee tool to be selected, and then fills can be applied

more readily. You have to toggle "wire frame" off before the screen actually allows you to see any examples of fill patterns.

Objects can be turned, rotated, moved, warped, and blended. All of the parameters that I experimented with performed flawlessly, though some took a bit of experimentation. There are various menus associated with each of the major alteration tools. The "Distortion Tool" in particular is worth spending time with, since it allows shearing on either the X or Y axis. You can execute Perspective on either the X or Y axis, and a choice of three symmetries is offered. The symmetrical tools work very well and can influence you to rethink your initial design.

When you've selected your text in a suitable font and size, it too can be open to all of the manipulations that any other object can reflect, as long as you first transform the text into an object. By choosing

"text -> graphic" from the Special Menu, the transformation is complete. For posters, the first letter of a headline can be completely redesigned, giving it special graphic Celtic illustrative characteristics. If you "ungroup" the letter you desire to work on from its neighbors, it can be filled in with a separate color or gray-scale screen. Control points can be added to the lines that connect other points in the letter, so that stretching it in creative ways is encouraged. In addition to the gray-scale fills, I wish there were ways to include user-designed patterned fills. This program would be perfect for experimenting with the various art screens that many printing houses use: wood grains, concentric circles, splayed line patterns, and various other design patterns.

As in Pro Draw version 1.0, 2.0 still gives you the capability to import bitmapped graphics, and then to use vec-

for tools to trace over them on the way to a final vector graphic. Then the bitmap is removed from the underlay for a totally vector rotoscoped image. It can also be left in place, giving you a printout with the best of both worlds: the rich screen textures of bitmaps and the straight no-jaggies linework of vector graphics. This is one of the most unique and useful attributes of Pro Draw.

The crème de la crème of Pro Draw 2.0's features list: the ability to fit text to any curve.

Pro Draw 2.0 also has a utility that allows you to translate an IFF picture into a vector trace automatically. You would be wise to start with a two bitplane image (black and white). Otherwise, after many minutes of precious time, the program may flag an "out of memory" condition. This option works great on B&W images, and is the perfect way to convert jaggy B&W clip art brushes without leaving the program.

And now for the crème de la crème of the features list: the ability to fit text to any curve. This is something that has always created nightmarish situations in typographic design. Pro Draw 2.0 makes it so easy and intuitive that I would consider purchasing this program for this one function alone. After a curve is drawn (either Bezier or freehand) and the text is printed out on a line, the user simply selects both the text and the curve and chooses "Align Text With Curve" from the menu. You can have the text align left, right, or center, and it can also follow the inside of the curve. This is an absolutely wonderful and mega-useful feature. It is something that all desktop publishing programs should emulate.

Version 2.0 works much faster than version 1.0, and there are no incessant crashes or "out of memory" flags in normal operation. I attempted to load Pro Draw's output into Soft Logik's PageStream (version 1.8). PageStream wouldn't open it, nor would it accept it as an imported vector graphic. Perhaps there's a wise hack out there who can write a translator so that files can be exchanged between Pro Draw and PageStream, allowing the best of both of these Amiga competitors to share each other's best attributes. I would think that some standardization here would benefit all concerned. Of course, the translation software from Syndesis would allow you to change the Pro Draw files into suitable CAD output that PageStream could read.

In conclusion, I must admit that I envy PostScript printer owners, because my attempted dot-matrix and HP-Laserjet

printouts do not look too good. I wish that Gold Disk and Soft Logik were pals, because I love the potential of this program as much as I am addicted to the non-PostScript printout quality that is an integral part of PageStream. If you have a PostScript printer, you should invest in Pro Draw 2.0. It has tremendous capabilities that, currently at least, cannot be found anywhere else on the market.

•AC•

Professional Draw version 2.0
Price: \$199.95
Gold Disk
5155 Spectrum Way, Unit 5
Mississauga, Ontario
Canada L4W 5A1
(800) GOLD-DSK
Inquiry #221

F-BASIC 3.0™

Original Features:

- Enhanced, compiled BASIC
- Extensive control structures
- True Recursion & Subprograms
- FAST Real Computations
- Easy To Use For Beginners
- Can't Be Outgrown By Experts

Version 2.0 Added:

- Animation & Icons
- IFF Picture Reader
- Random Access Files
- F-Basic Linker
- Improved Graphics & Sound
- RECORD Structures
- Pointers

Version 3.0 Added:

- Integrated Editor Environment
- 020/030 Support
- IFF Sound Player
- Built In Complex/Matrices
- Object Oriented Programs
- Compatible with 500, 1000, 2000, 2500, or 3000

F-BASIC™ With User's Manual & Sample Programs Disk
 —Only \$99.95—

F-BASIC™ With Complete Source Level Debugger
 —Only \$159.95—

F-BASIC™ Is Available Only From:
DELPHI NOETIC SYSTEMS, INC.

Post Office Box 7722
 Rapid City, SD 57709-7722

Send Check or Money Order, or Write For Info
 Credit Card or C.O.D. Call (605) 348-0791

F-BASIC is a registered trademark of DNS, Inc.
 AMIGA is a registered trademark of Commodore/AMIGA, Inc.

Circle 110 on Reader Service card.

NEW PRODUCTS & other neat stuff

by John Rezendes

Mightier Than The Pen

New Horizons Software has just released **QuickWrite**, an entry-level word processor that provides high performance and advanced features on minimal Amiga systems. **QuickWrite** packs a lot of power and ease of use. Features include a fast "WYSIWYG" display, an advanced mail merge facility, spell checker with a 50,000-word dictionary, macros, an ARexx port, and automatically updated date and time markers.

QuickWrite also controls printing options including support for paper sizes and the ability to print in Pica, Elite, or Condensed pitch. **QuickWrite** users will be able to export and import text files in the format recognized by Gold Disk's Professional Page. And, since **QuickWrite** is file-compatible with New Horizons' popular higher-end word processor, **ProWrite**, documents are transferrable

from **QuickWrite** to **ProWrite** without any loss of content or formatting. Any program that can import **ProWrite** files will handle **QuickWrite** files as well. **QuickWrite** requires a minimum 512K memory and Kickstart 1.2 or later.

QuickWrite, price: \$75.00, New Horizons Software, P.O. Box 43167, Austin, TX 78745, (512) 328-6650. Inquiry #236

Power Struggle

Electronic Arts has just released a new adventure/strategy game entitled **PowerMonger**. This is the latest program from Bullfrog, the same UK artist group that created **Populous**.

In **PowerMonger**, strategy is based on every individual's occupation, home, and level of intelligence. This adventure begins with you as a deposed king in charge of a tribe in an uncharted territory. You must conquer all 200 territories (each begins with a different layout design) before the world is under your rule, and you must do this by taking over merchant and fishing communities, villages, and large towns. Resort to the usual pleasurable means of achieving your ends: brute force, cunning negotiation, or outlandish brib-

ery. You must then demand that your people create new technologies, such as weapons, to use in invading other villages. The captains you enlist in your tribe all have different personalities; this fact comes into play when giving orders.

3-D vector graphics create a land with hills, plains, roads, buildings, trees, lakes, boats, and even animated waterfalls and streams. The amazing graphics also depict living beings such as fishermen, farmers, ranchers, cattle, sheep, and carrier pigeons for delivering orders.

Changes in seasons lead the farmers to harvest their crops, the ranchers to bring in their herds, and the birds to migrate. A generous selection of angles and magnifications allow you to view the land from many different perspectives.

In game play you will go against three other computer-controlled **PowerMongers**. One of these may be substituted with another person using two computers linked via modem. A data disk and clue book will be coming soon.

PowerMonger, price: \$49.95, Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404, (415) 571-7171. Inquiry #235

Gone Pro

ASDG Incorporated has released **Art Department Professional**. It becomes the latest member of the ASDG Art Department Series 8- and 24-bit color image processing and manipulation software.

Image produced using ASDG's new
Art Department Professional

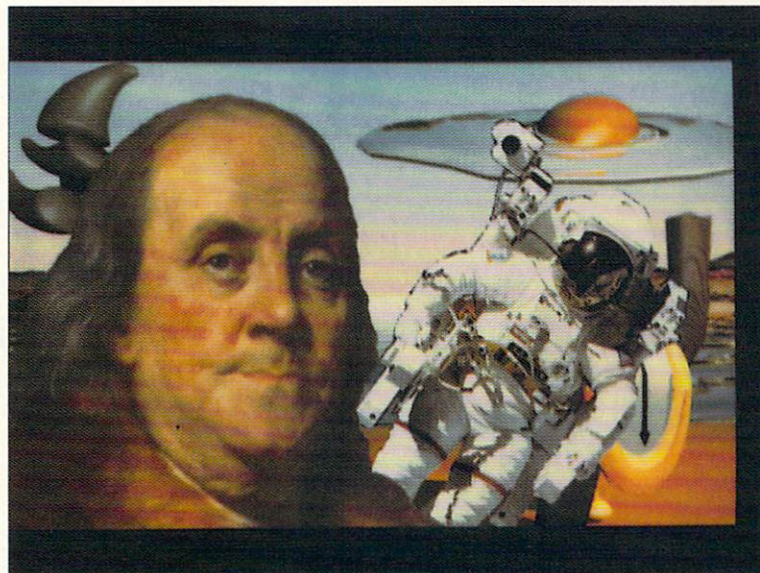
Art Department Professional is based on a system of loader/saver modules which make it possible to save images in addition to importing them, and provides the ability to render up to 256 colors, enabling transformation of images to other platforms. Among the external hardware devices that can be controlled through this program are Polaroid's CI-3000 & CI-5000 film recorders, Black Belt Systems' HAM-E image display enhancer, and Sharp's JX-450 & JX-300 24-bit color scanners.

Loader and saver modules for DigiView 21-bit, Sculpt, Silver, GIF, PCX, DeluxePaint II Enhanced, and MacPaint formats are included in the Art Department Professional package. File formats supported by the Super-IFF loader include EHB, HAM, AHAM, SHAM, Dynamic HAM, ARES, and Dynamic HIRES.

Art Department Professional features a wide range of special effects and computer image-manipulation tools, including the ability to perform color-to-gray scale conversions and magazine-quality color separations from any image data source with up to 24 bitplanes. Other features include 208 Amiga rendering/video modes, six methods of dithering, automated image "touch-up" mode, and an edge-detection technology that allows users to create line art from any image.

Powerful palette control is also at your command with various features such as editing, lock in, and the ability to load and save combinations. Color map controls, brightness, contrast, and Gamma correction are also included. Art Department Professional is also ARexx-supportive.

Additional loader and saver modules for Targa, TIFF, Pict2, and Rendition formats are contained in the **Art Department Professional Conversion Pack**. A companion module to Art Department Professional, **Art Department Presentation Graphics Pack**, is designed to combine business graphics and multiple images.



Art Department Professional, price: \$199.95, Inquiry #232. Art Department Professional Conversion Pack, price: \$89.95, Inquiry #233. Art Department Presentation Graphics Pack, price: \$129.95, Inquiry #234. ASDG Incorporated, 925 Stewart Street, Madison, WI 53713, (608) 273-6585.

The Name Game

Blue Ribbon Bakery, Inc., makers of Bars&Pipes, have changed their company name to **The Blue Ribbon SoundWorks, Ltd.** The company is located at a new address as well: 1293 Briardale NE, Atlanta, GA 30306, (404) 377-1514.

All-terrain Vehicle

Virtual Reality Laboratories, Inc. has announced the shipment of **Vistapro**. This application creates painting-like views and animations of real locations with power and ease. **Vistapro**, which requires 3 megs, incorporates many features not found in the original Vista. (The original program, which requires 1 meg, will still be available.) Some of those features include displays in 24 bit (frame buffer), hi-res, interlace or HAM; script support for four animation modes including IFF, IFF 24, RGB and the **Vistapro** proprietary VANIM mode; an included animation player for VANIM files from hard disk; variable fo-

cal length "camera" lens; an unlimited number of lighting positions, dithering, roughness, and blend controls; Gourand shading combined with hi-res interlace; the ability to load and save color maps; and the ability to save images as IFF, Turbo Silver objects and in 24-bit RGB for frame buffer output.

Various landscapes of places such as Mt. St. Helens (before and after the explosion), Half Dome, and El Captain in Yosemite are included, as well as over four billion fractal landscapes, original Mandelbrot and Julia set landscapes, Mt. Adams, Mt. San Gorgonio, Mt. Baldy, San Luis Obispo, and the Carmel-Big Sur area. Animators, graphic artists, game designers, geology teachers, students, and those involved with the environment may all benefit from **Vistapro**. Additional sets providing more landscapes are available for \$80.00.

Vistapro, price: \$149.95, Virtual Reality Laboratories, 2341 Ganador Court, San Luis Obispo, CA 93401, (805) 545-8515. Inquiry #240

Aegis/Oxxi Two-fer

VideoTitler, by Aegis, is a powerful 3-D font and image manipulation system which will work with your Amiga monitor, video recording system, or color

Turn up a Volume!

**The Complete Amazing Computing library
which now includes Volume 5**

is available at incredible savings of 50% off!

◆ **Volume 1 is now available for just \$19.95*!** ◆

(A \$45.00 cover price value, the first year of AC includes 9 info-packed issues.)

◆ **Volumes 2, 3, 4, & 5 are now priced at just \$29.95* each!** ◆

Subscribers can purchase freely redistributable disks at bulk rate discount prices!**

This unbeatable offer includes all Fred Fish, AMICUS, and AC disks

(see the back of this issue for recent Fred Fish additions, and the

Fall/Winter'90 AC's Guide

for a complete index of all current freely redistributable disks).

Pricing for subscribers is as follows:

- ◆ 1 to 9 disks: \$6.00 each
- ◆ 10 to 49 disks: \$5.00 each
- ◆ 50 to 99 disks: \$4.00 each
- ◆ 100 disks or more: \$3.00 each

(Disks are priced at \$7.00 each and are not discounted for non-subscribers)

To get FAST SERVICE on volume set orders, freely redistributable disks,
or single back issues, use your Visa or MasterCard

call 1-800-345-3360

Or, just fill out the order form insert in the issue.

* Postage & handling for each volume is \$4.00 in the U.S., \$7.50 for surface in Canada and Mexico, and \$10.00 for all other foreign surface.

** AC warrants all disks for 90 days. No additional charge for postage and handling on disk orders. AC issues Mr. Fred Fish a royalty on all disk sales to encourage the leading Amiga program anthologist to continue his outstanding work.

printer. The package includes many exciting functions and allows you to give sophisticated computer DVE style presentations. The fonts you have at your disposal include all the Amiga fonts, Zuma fonts, and anything made with Calligrapher. There is also a series of powerful fonts called Poly Fonts, and they allow you to stretch, mirror, and distort at the click of a mouse. Special effects such as 3D Block, Thin Edge, Emboss, Balloon, Outline, Neon, Star, and Cross are also available. They may be displayed with bold, italic, outlined, color gradation, or drop shadow in eight directions. An Expert Mode is available which gives you the tools to build your own special effects, and Multiple Resolutions allows you to work in every Amiga resolution including Halfbrite mode, overscan, and severe overscan.

VideoTitrer is also a powerful support system for IFF paint programs. With it you can import IFF windows, brushes, and pictures and then clip, paste, and distort the images. They may be inverted, mirrored, or used for titling. The screen may also be quartered or compressed and then the Extra Halfbrite chip (where available) can be used to your advantage.

There is also a powerful slide show program called VSEG that can create desktop videos and presentations. By using a series of digital transitions such as checker, random, diamond, title scroll, fade, burst, dissolve, and zigzag you will

be able to combine images together. Playbacks can be controlled in either manual, automatic, or single frame advance. VideoTitrer works with color printers, camcorders, VCR's, genlock devices, and film recorders.

Also new from Aegis is **AudioMaster III**, a powerful digital sampling system that allows for the recording and storage of real-life sounds on your Amiga. Many features come with the AudioMaster III including Interactive Visual Waveform Editing, a process that lets you load sound files or digital samples and then visually display them on the screen; a Zoom Mode, which lets you select a segment of the samples sound and zoom in to view or edit details; Multi-Loop Sequencing, which allows you to easily create up to 999 sound loops within a single waveform and then play them in a defined sequence; and a Waveform Tuner, which changes the pitch and octave of any sound and then fine tunes it.

Along with those features there is also MergIFF for merging sounds, MultiMaker which creates instruments for Deluxe Music and Sonix, and the Oscilloscope program and an Aegis CD player which control playing of up to 20 stored sound files.

VideoTitrer, price: \$159.95, Inquiry #241.
AudioMaster III, price: \$99.95, Inquiry #242.
Oxxi/Aegis Development, 1339 E. 28th Street, Long Beach, CA 90806, (213) 427-1227.

New From Psygnosis...

Nitro and **Awesome** are two new releases from Psygnosis. In Nitro your driving skills are tested on different terrain (wasteland, desert, city, and forest), in more than 30 wild races. You must select the proper vehicle (buggy, racer, or sports car) for the best results and, as you compete, enhancements such as a more powerful engine, turbochargers, high grip tires, nitro-boosters, and extra gas are available. Viewed from above, Nitro is a multi-directional scrolling race game with realistic animation and detailed roadside graphics.

Awesome is a space adventure that places you in the role as a ship's captain attempting to escape the Octarian system before it is blown away. All information is to be kept secret as you try to acquire fuel, which is the hot commodity, in these days of gargantuan space monsters and vicious aliens. Hyperspace travel from planet to planet involves using a Plan-View, Time-Scan map of the Octarian system, so you must take into consideration hotel bills and fuel consumption in all decisions.

Nitro, price: \$44.99, Inquiry #238.
Awesome, price: \$59.95, Inquiry #239.
Psygnosis Limited, 29 Saint Mary's Court, Brookline, MA 02146, (617) 731-3553.

Gold Disk Giveaway

Gold Disk has announced a contest designed to promote their new product, **HyperBook**. Gold Disk used HyperBook to create a graphic presentation showcasing the Gold Disk product line. Not only is this point-and-click presentation free to the consumer, but it contains the chance for prizes such as Sony Discmans, posters, and tee-shirts, to be won!

The contest begins this month. HyperBook presentation disks will be available inside Gold Disk product boxes, from dealers, and through mail order houses. Instant winner disks are redeemable by sending the disk, along with name, address, and phone number to Gold Disk (employees of Gold Disk, Commodore, and Amiga dealers are not eligible).

Gold Disk Inc., 5155 Spectrum Way, Unit 5, Mississauga, Ontario, Canada, L4W 5A1, (416) 602-4000. Inquiry #237

•AC•



Taming the wild, misspelling beast in us all...

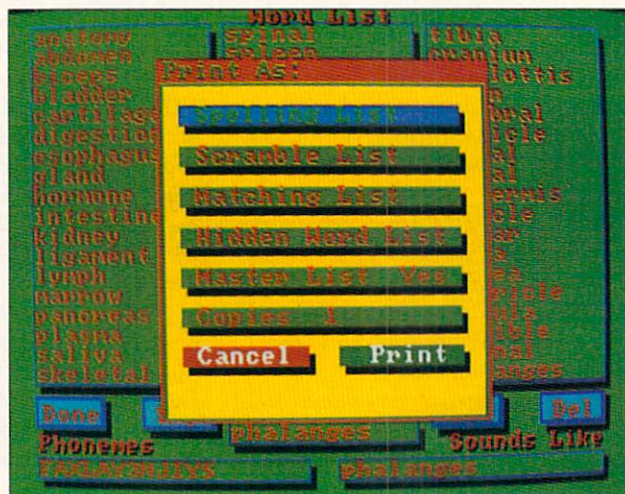
Spell-A-Fari

by Jeff James

Spell-A-Fari is a new educational program from Designing Minds Software which attempts to teach and reinforce proper spelling skills in school age (grades K-9) children.

What I noticed first about Spell-A-Fari was the fact that it is devoid of any sort of copy protection whatsoever. Games and educational programs for children are almost always subjected to greater than normal wear and tear, and I must applaud Designing Minds on their decision to allow legitimate owners to easily back up their software investment. Spell-A-Fari is also hard drive installable, including a CLI-driven script to do the installing for you. Unfortunately, the program cannot be loaded from the Workbench unless you install it on your hard drive or boot it from df0: in place of your Workbench disk.

After the program has loaded, you're presented with the game selection screen. This screen portrays a jungle scene complete with three jungle animals surrounded by foliage, along with a wooden sign displaying the words "List" and "Bye!". Pointing and clicking on each of these



The Print As option from the Word List



Patty the Parrot

three critters will load a different spelling game, "Bye!" will exit the program, and the "List" option will take you to the heart of Spell-A-Fari, the word list screen. A needed feature on the game selection screen is a verification option on the "Bye!" hot spot; a slip of the mouse while trying to select the "list" option on the sign unceremoniously dumped me from the program without an opportunity to cancel my selection.

Once you arrive at the word list screen, the pull-down "Project" menu gives you the ability to Open, Create, Delete, Save, Print and Sort your own spelling lists, as well as the option to print color award certificates for players with superlative spelling. The word list screen is also where you can enter your own words and fine-tune how the Amiga pronounces them by using the provided Preview option. The Help menu offers a quick list of helpful consonants and phonemes to aid you in making your word sound just right. Several spelling lists are included with the program when purchased, or you can create your own lists with up to 54 words not exceeding 12 characters in length.

Aside from being able to create your own spelling lists, the most powerful option in the word list screen is found in the pull-down Project menu; the Print option. Selecting the Print option presents you with the Print list menu, which gives you a great deal of control over the printed output of your spelling lists. Of special interest to educators is Spell-A-Fari's ability to create actual worksheets of spelling words for their students. Besides printing a list of words, an educator can use the Print list menu to print scrambled word lists, matching word lists and a word list puzzle which mixes up all the words of a selected list in the form of a "word hunt" puzzle. When printed, each of these worksheets is accompanied by a single master list which contains the solutions to the other printed lists. Kudos to Designing Minds for adding these extra features which make Spell-A-Fari a much more useful teaching tool to educators than a simple "Drill and Practice" spelling game.

After selecting your list, you return to the game selection screen. Starting the game is child's play: simply point and click the mouse on any one of the three animals displayed. After an animal is selected, the game play requestor appears. This requestor allows a wide variety of game parameters to be customized, including the desired number of human and computer players (up to two), the computer's skill level (if a computer player is selected), the players' names, and a range of other game options including time limits, number of attempts allowed to get each word correct, and a choice of "Easy" or "Hard" difficulty levels.

Once you have your options set, you're off into the jungle. The game with "Elly the Elephant" asks the user to correctly spell the words that the Amiga vocalizes; the game with "Mike the Monkey" challenges the player to select the single correctly spelled word out of a short list of incorrectly spelled words; and the "Patty the Parrot" game offers users a chance to match scrambled words with their unscrambled, correctly spelled counterparts. Correct spelling is rewarded by a praising digitized voice, and if the round is successfully completed, the animal whose game you've selected hops, flaps, or wiggles onscreen while making its own respective digitized animal noise.

While Spell-A-Fari is well-equipped with playing options and advanced features for educators, its major stumbling block rests in the treatment of graphics and animation. The artwork is rather plain and rudimentary, with all three of Spell-A-Fari's resident animal inhabitants appearing flat and two-dimensional. The animations, that greet a player after a round of spelling problems have been accomplished, are limited. Patty the Parrot only flaps her wings and squawks, Elly the Elephant wiggles her trunk while trumpeting loudly, and Mike the Monkey seems to do only a few deep knee bends while waving a banana and shrieking. Even if you have successfully played a few dozen rounds of the game, the animation you get to see after each successfully completed round never changes. I was

hoping for a nicely done animation of a yodeling, vine-swinging Tarzan to swoop onto the screen every now and then to tell me what a great speller I was, but I guess he was on vacation. Crisper, brighter graphics coupled with a wider variety of longer-duration animations would undoubtedly increase the interest and attention span of any child (or adult, for that matter) using this program.

Concerning Spell-A-Fari's use of digitized sound, there only seems to be one problem: not enough variety. After the correct answer has been selected in a round, an enthusiastic, digitized male voice congratulates the player by saying, "That is correct." If you incorrectly spell or mismatch the word, the same voice returns and says, "That is not correct." If you fail a few times, the Amiga voice will speak and urge you to "keep trying." The decision to use superior digitized speech to accompany the synthesized Amiga voice is laudable, yet hearing "That is correct" a few dozen times in a row during a long spelling exercise set my teeth to grinding; when telling you of your correct selection, there are no other digitized sounds or voices thrown in to add some variety and unpredictability into the game. If you want to silence this merry digitized commentator of your spelling attempts, you have to turn down the volume on your monitor or stereo, as Spell-A-Fari won't let you turn him off.

I would liked to have seen a few other features implemented into Spell-A-Fari, such as the inclusion of an option to save your spelling lists in true ASCII text format to allow you to run them through your favorite spell-checker or thesaurus, and the ability to enter words longer than 12 characters in length.

Although Spell-A-Fari does have some problems, the sum of its individual parts combine to make it a good value. It's relatively inexpensive, and the ability to print a variety of color certificates, along with the wide range of printing options and utilities make Spell-A-Fari a good choice for an Amiga-using educator looking for a teaching aid for spelling. The ability to enter your own words and fine tune them (using the provided help screens for phonemes and consonants) makes Spell-A-Fari a fun and educational game for older children and adults as well. If you can overlook the limitations listed above, Spell-A-Fari can be a valuable learning aid not only for children, but for anyone interested in sharpening their spelling skills.

•AC•

Requirements:
Min. 512K of RAM
Workbench 1.2 or higher

Spell-A-Fari
Designing Minds
3006 North Main Street
Logan, Utah 84321
(801)-752-2501
Price: \$39.00
Inquiry #220



by Phil Saunders

Welcome to Medley, a new column about music, the Amiga, and MIDI. My objective—to survey all the ways you can make music with your Amiga. I'll give hints for making your software work better and show you some of the ways MIDI can work for you. The Amiga can make even a mediocre musician sound great—if he or she knows how to use it. Medley will help you bridge the gap between software manuals and the reality of making music.

The Amiga has better sound generating capabilities than almost any other home computer. But sometimes its built-in sounds either aren't good enough, or the music you are making requires more than four notes at a time.

In this case, you need to learn about MIDI. MIDI stands for Musical Instrument Digital Interface. MIDI was originally developed as a way to play more than one synthesizer from a single keyboard, but it has been extended to allow a whole host of synthesizers, effects devices, and computers to communicate with one another. MIDI is basically a language that allows your Amiga to control a whole rack of sound equipment.

MIDI consists of commands which tell a synthesizer to do specific tasks. A typical command might consist of three bytes of information which tell any synthesizer listening on channel eight to play a C3 note at a velocity of 96. While the MIDI command is specific about what it wants done, it has no way of knowing how the synthesizer will carry out the command. For instance, the synthesizer might be set up to play an organ voice or a flute voice on channel eight; MIDI has no way of knowing. MIDI has only one purpose: to carry musical information to and from synthesizers

and computers. How those synthesizers respond depends on how they are designed and set up. The actual sound comes from the synthesizer's audio output, not its MIDI OUT. MIDI commands pass note information, but only a synthesizer's audio output produces sound. MIDI is actually a standardized control system.

To use MIDI with your Amiga, you need three things: software that generates and/or receives MIDI, a synthesizer that generates and/or responds to MIDI, and a MIDI interface to let the computer and the synthesizer communicate. The MIDI interface can range from a simple one IN, one OUT model to a more complex two IN, six OUT model. The number of INs and OUTs refers to the number of devices that can be directly connected to the interface. An IN receives information from a MIDI device, an OUT sends information to another MIDI device, and a THRU passes information from the IN to another device. Your needs will vary depending on how many MIDI devices you want to hook up to your Amiga. Remember that if a device has a THRU you can use that to "daisy chain" to another synthesizer, eliminating the need for an extra OUT on the Amiga's MIDI interface. Be sure to purchase a model appropriate for your

computer (Amiga 1000 designs differ from Amiga 500/2000 interfaces). You will probably find a design that includes a serial port pass through to be most convenient.

The next pertinent question is what kind of synthesizer you need. This is a personal question. The answer depends on what kind of music you want to make, how you want to make it, and how much you can afford to spend. Personal taste has a lot to do with choosing a synthesizer. Still, there are a number of factors that are particularly important in choosing a synthesizer to work with a computer.

The first thing to consider is whether you need a keyboard. Wait! I thought all synthesizers had keyboards! Since the advent of MIDI, a number of manufacturers have begun making synthesizers without keyboards. These sound modules respond to MIDI data generated by either a computer or a keyboard. The advantage is that you don't have to pay for a keyboard if you don't need one. Many professionals use one master keyboard, often referred to as a controller, to drive a whole bank of MIDI sound modules. It might be useful to think of a keyboard as a device that generates MIDI data and a sound module as a device that responds to MIDI data. A typical synthesizer includes both a keyboard and a sound module, and is thus capable of sending and receiving MIDI. If the extent of your music making is going to be typing scores into Deluxe Music Construction Set, you may find that a keyboard is unnecessary. Examples of MIDI sound modules without keyboards are the Roland MT-32 and the EMU Proteus.

If you do need a keyboard, you should consider whether you need the full 88 keys. Many synthesizers have only 61 keys to reduce costs. The keyboard should definitely be velocity-sensitive—that is, the volume of the notes should change depending on how hard you strike the keys. Aftertouch is another useful feature. It measures how hard you press on the keys after they have been played. Aftertouch is typically used to apply effects to synthesizer notes. If you are an accomplished pianist, you may want to consider getting a good MIDI controller—a keyboard which feels much like a real piano but which generates only MIDI data, not actual sounds.

The next consideration is how many voices the synthesizer can play at once. There are two aspects to this. The first considers how many individual notes a synthesizer can make at one time. Many of today's synthesizers have 32 individual sound generators. While this seems like a lot, sometimes the best sounds on the synthesizer require as many as four sound generators. This reduces the number of available notes to eight at a time. If a synthesizer is multitimbral, it can play more than one sound at a time. You can have one part of the synthesizer playing a bass sound, one part playing drums, and a third part playing a piano sound. This is an extremely valuable feature for working with a computer. Most newer synthesizers are multitimbral, but some older ones (like the Yamaha DX-7) are not.

Additional considerations include what kind of MIDI implementation the synthesizer has. Does it respond to the full spectrum of MIDI commands, on all channels? Will the keyboard only output on one channel? Most modern synthesizers will have a full MIDI implementation, but older models might not. It is possible to get a synthesizer which has a velocity-sensitive keyboard, a full MIDI implementation, and multitimbral sound generators for under a thousand dollars. One thing you probably don't need is a sequencer that is built into the synthesizer. Sequencers that run on the Amiga are generally more powerful and easier to use than those built into synthesizers. Why pay for something you don't need?

All of these points are important, but the most crucial factor is how the synthesizer sounds. It doesn't matter how many voices a synth has if you don't like the sound. Use your own ears, and listen to as many different models as you can. Think about how you will use it. Do you want to compose symphony scores? Then you will need a synth with realistic orchestral sounds. If you want to make top forty pop music, then you need a synth that can create those kind of sounds. Multitimbrality and MIDI implementation are important, but making interesting sounds is why synthesizers were invented. Next time we'll look at the types of MIDI software available for the Amiga.

•AC•

On The Road:

Amiga '90, COMDEX, and The World of Commodore Amiga

THIS MONTH AC TRAVELED the globe in search of new Amiga products. From the latest in presentation and 3-D software to the first public showing of CDTV, AC was there. Here is the latest from Köln (Cologne), Germany's Amiga '90, to COMDEX in Las Vegas, to the biggest Amiga event in North America, The World Of Commodore Amiga in Toronto, Canada.

Köln,
Germany



Amiga '90 in Köln, Germany maintained its predominance as the world's largest show for the Commodore Amiga. With over 150 exhibitors in two large exhibition halls presenting new and exciting products to the European Amiga market, Amiga '90 attracted over 60,000 attendees in four days, from November 8 to November 11.

Last year the show drew 38,000 people and was held in a 5,000-square-meter exhibition area. This year, AMI Shows was prepared for the enormous response. With an expected attendance of 50,000 to 60,000 people, AMI Shows placed the exhibition in two halls with a total of over 25,000 square meters. The larger halls also attracted more exhibitors. With one hall created predominately for the entertainment user and the larger hall set aside for the business and professional user, attendees were able to locate the companies and products they were most interested in.

Although Amiga '90 is predominately a German showcase of Amiga products, the number of North American companies who attended the Amiga '90 was amazing. Companies such as Gold Disk and Pulsar are now broadening their consumer base with offices in Europe and were well-represented. It was encouraging to see other companies either exhibiting on their own or with their German distributors. Great Valley Products, NewTek, Interactive Video Systems,

Digital Creations, Blue Ribbon SoundWorks, ICD, Supra Corporation, OXXI/Aegis, Applied Engineering, VidTech International, Memory World, M.A.S.T. and Dr. T's Music Software were just a few of the companies represented.

Eric Moody of Interactive Video Systems and John Botteri of Digital Creations teamed together to provide working demonstrations of Digital Creations' DCTV working in conjunction with the Trumpcard Professional from IVS. Although DCTV was not ready to ship (see the section below on DCTV at COMDEX), Trumpcard Professionals sold out during the four-day exposition.

Sharing space was a basic program during the event. Jeff Costello from Applied Engineering worked within Applied's distributor's booth offering product support to anyone who spoke English. Melissa Jordan Grey worked in one of her distributor's areas to demonstrate the tools and techniques created for music and multimedia presentations by The Blue Ribbon SoundWorks, Ltd.

Supra Corporation exhibited in a very large booth, demonstrating their product line at one end of the booth and selling products at the other end in conjunction with one of their German distributors. New Supra products displayed included the SupraRAM 500 RX, an external memory board for the 500 expandable to 8MB of RAM. Also new from Supra were several modems: the SupraModem 2400 Plus, the SupraModem 2400 MNP, and the SupraModem 9600 Plus, a V.32 9600 bps modem with V.42bis which can run up to 19,200 bps. Supra also showed a prototype of their SupraTurbo 040, a 68040 accelerator for the 3000. There was also talk of a new 24-bit color frame grabber from Supra. The product is rumored to digitize a full color video frame in 1/30 of a second and also digitize stereo audio.

Perhaps the best represented of the American hardware manufacturers was Great Valley Products. GVP not only had their top executives working with DTM, their distributor, in the second largest booth at the show (Commodore occupied the largest booth area), but they drew hundreds of attendees each day for a daily

drawing of GVP hardware and accessories.

If there had been awards given for dedication and devotion to a company and product, one would surely have been presented to Kristine "Kiki" Stockhammer from NewTek. Ms. Stockhammer demonstrated NewTek's Video Toaster for three days to a growing number of attendees while addressing them in German. She then took a plane early Sunday morning and flew from Germany to Las Vegas. From Monday to Friday she continued to give the same presentation to crowds of COMDEX attendees in English.

Aside from North American companies, there were several new introductions from European developers.

Real 3D is the newest release from Activa International B.V. The NTSC version will be available the first quarter of this year. Real 3D promises superfast 3-D ray tracing, solid modeling, texture mapping, and animation. The package comes in three versions. Real 3D Beginner is recommended for users with 1 meg of RAM or more who do not need the macro features found in the more expensive versions. Real 3D Professional was created for more intensive graphic sessions and requires a minimum of 3 meg of RAM and includes all macro segments. Real 3D Turbo is a professional package specifically designed to assist professional users and take advantage of the higher speed capabilities of accelerator cards.

Activa promises that Real 3D is the fastest tool of its kind on the market. The demonstration given in Köln was impressive indeed. Wireframe drawings were created and manipulated in real time, while rendering 3-D images in a variety of resolutions was as easy as selecting options from a menu. Real 3D also contains software control and options to move your created images (or the view point) along paths and automatically generate a series of frames for animations.

Scala by The Digital Vision Software Design Group is a fully interactive presentation program just made available to the European market. Scala offers the user a selection of backgrounds and special effects to create slide presentations to be

performed on the Amiga. Special text tools allows the user to manipulate text and fonts in an almost endless variety. Scala will also import animations created on third-party animation programs. The entire end result is then presented by a script that the user has constructed through Scala's scripting language. Scala also comes with Scala Print which creates a variety of different hard-copy formats on black & white, color, or even PostScript™ printers. Scala will not be available in an NTSC version until sometime during the first quarter of this year.

Martin Lowe of Amiga Centre Scotland made two very important announcements at Amiga '90. First, the ACS Harlequin 32-bit framebuffer will be available in the US sometime during the first quarter of this year. With 16,777, 216 colors, broadcast-quality output, full overscan, programming interface, and PAL or NTSC compatibility, the Harlequin can be used in interlace and non-interlace modes. ACS promises the Harlequin will be a "professional product for the professional user." To promote this fact, the company has planned a series of upgrades including a video framegrabber, a CCIR 656 interface for 601 digital video, an Alpha channel addition, and a double buffering addition. To further the professional use of their product, ACS has made the Harlequin compatible with single film controllers, film recorders, the Harlequin genlock, PAL encoders, video printers, and assorted graphic input devices. The Harlequin has a suggested retail price in the US of \$1395.00 with 1.5MB (it is expandable to 4 MB).

Second, Mr. Lowe announced the formation of GRAFEXA, Graphics EXtensions for the Amiga. This group of independent hardware and software developers met to establish standards for the Amiga to deal with more colors or higher resolutions than does the standard model. According to their press release, "GRAFEXA will act as a forum for discussion of the requirements of the new standards and will circulate a newsletter which will include proposed ideas and comments." The organization will meet again during the European Developers Conference in Milano in February, 1991.

The large German hardware manufacturers, Rossmöller and Kupke, who have been exhibiting at American shows had enormous booths with plenty of traffic. Although there seemed to be no major announcements from these two competitors, activity at their booths was high.

Commodore held a magnificent presence at Amiga '90. Their large booth was populated by companies from Eu-

rope and North America. The area was constantly busy with people watching the large number of demonstrations.

Crowds gathered around Commodore's booth area to watch the large video wall overhead. CBM used the device to present animations and other Amiga-generated art. Although this was inspiring, the most fascinating thing was the large wall CBM had constructed around one segment of their booth.

Within a few hours of the first day for general admission, the Commodore-constructed wall was covered with graffiti. Spray cans, magic markers, and just plain old pens were used to send messages from individuals or groups to the Amiga community. While some people used it for more profane correspondence, the wall represented the excitement and intensity of this market. The fascinating thing is not that people wrote on the wall, but that Commodore Business Machines of Germany had provided the space.

While some manufacturers used full-sized cars as input devices, others used simple mechanical arms to attract atten-

tion. Large video walls were used in several areas of the show, while other companies displayed their latest products in simple glass cases. The key impression from Köln was not its size in terms of vendors, nor its ability to attract the thousands of attendees, but the excitement that was generated as the attendees awed over the possibilities of their favorite computer.

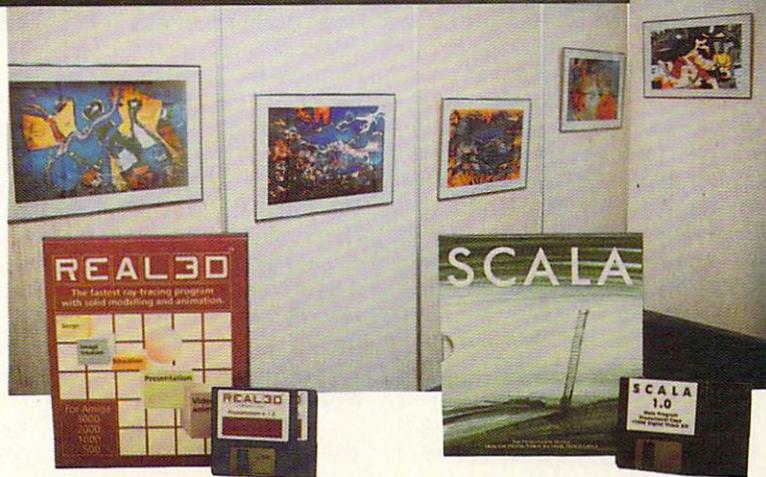
Las Vegas, Nevada



The Fall '90 COMDEX in Las Vegas was the largest exhibition of any type ever held in North America. Over 126,000 attendees came to see 1850+ exhibitors; even the number of press people hit an all time record of 1800! The Sands Exhibition Center was completed one week prior to the opening of COMDEX to bring the total exhibition area used by the show to



Amiga art is expression—from graffiti to saleable art to art and presentation packages, the Amiga inspires and enables them all.





NewTek's Kristine Stockhammer takes a moment's rest while thousands of Amiga users and hopefuls roam the exhibit halls.



2,100,000 square feet. Although Commodore Business Machines and Amiga third-party developers did an excellent job of presenting and selling Amiga technology, make no mistake that COMDEX is mainly an event for IBM, PC clones, and third-party supporters of PC-related products. Even Apple Computer, which occupied a large booth area with a video wall and lecture center for COMDEX, only maintains a presence at COMDEX, reserving MacWorld as the primary theater for its largest marketing efforts.

Bill Gates, Chairman and founder of Microsoft Corporation, set the direction and focus of this year's COMDEX by showing tools and integrated packages for the future. According to Mr. Gates, computers need to make applications fully interactive and effortless for the user. Most of the advancements Mr. Gates demonstrated through a humorous look at a fictitious town were based on future Windows-style applications. Except for the touch-screen technology and the hardware that would allow users to actually sign and write information by hand, the basic attention was given to making applications work efficiently together. Since this requires a simplified visual style interface, it is important to note that Mr.

Gates's Microsoft Corporation has created one—Windows for the PC.

Even the organizers of COMDEX, The Interface Group, were searching for more ways to support and promote the Windows technology. They announced a concurrent show to be presented at the Spring COMDEX in Atlanta called Windows World '91. Windows World is a central area to gather independent companies who are creating products for the Windows environment.

David Archambault, Director of Business Markets for Commodore Business Machines, hosted the only Amiga-oriented panel on multimedia of the five multimedia conferences conducted during COMDEX. His guests included Alain Rossmann, Vice President of Marketing, Sales, and Operations at C-Cube Microsystems; Art Kaiman, Engineering Director of the Princeton Division of Intel Corporation; Kalish Ambwani, President of Gold Disk Inc.; and Tim Jenison, President of NewTek, Inc. In a forty-five minute presentation, each panel member demonstrated the progress their companies had achieved in making multimedia more affordable and more possible than ever.

Tim Jenison presented NewTek's Video Toaster to create special effects in

on-line video. Kalish Ambwani presented ShowMaker and its long list of features that allow the Amiga user to manipulate an entire presentation from several different sources and create a tape at a video facility in one take. Both Mr. Rossmann and Mr. Kaiman demonstrated the special properties of compressed video that they have been able to attain with their companies' hardware.

Commodore's flagship booth was host to several Amiga developers as they demonstrated the versatility of the Amiga. Gold Disk maintained an area that specialized in music and presentation software. By using their ShowMaker and Blue Ribbon SoundWorks' Tools, they were able to demonstrate the ease with which individuals can create presentations and full videos.

Digital Creations, placed strategically next to Gold Disk, performed special feats of magic with the tools and versatility of their new DCTV (Digital Composite Video), expected this month. DCTV displays full-color composite video and uses a proprietary compressed video system to generate stunning color, broadcast-quality effects.

While DCTV is a great output device, it is also a slow scan video digitizer. With a color video camera, DCTV captures a full-color composite frame in 10 seconds which then can be manipulated or converted to IFF format. With the included DCTV paint, DCTV users have a true color video paint system. Special features have been added to the traditional paint system such as tint, shade, watercolor, blend, smooth, air brush, and a host of drawing features. With a suggested retail of \$495.00, DCTV is an impressive addition to an Amiga artist's arsenal.

DynaCAD is the newest Amiga CAD package. It was demonstrated both at COMDEX and at WOCA by Ditek International. With a wide assortment of rich tools available, Ditek officials claim that DynaCAD is a truly professional CAD package. DynaCAD includes dimensioning, 3-D view capabilities, line weights and styles selection, text tools, on-line documentation, command history, and flexibility through its large number of user-specific menus. People gathered to watch as complex drawings were rotated in three dimensions. (Or were they waiting for copies of renderings of the Starship Enterprise that was being printed on the plotter?)

Commodore displayed a new point-of-sale unit that was created for dealers with a laserdisk, and software to allow purchasers to use an Amiga to answer

(continued on page 31)

Sapphire 68020/68881

Unbeatable Retail price of \$399.00!

Fits in the Amiga 1000, Amiga 500 and Amiga 2000 computer systems.

Fits snugly in 68000 processor socket!

Easy installation - Included is a disk with pictures, a text file reader, and benchmark software to help with installation!

Factory installed 12 MHz 32-bit 68020 and factory installed 12 MHz 32-bit 68881 processors!

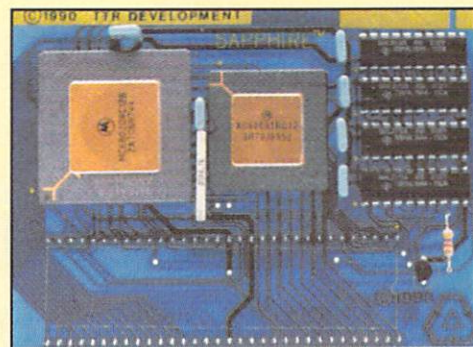
Speed increases of up to 2.4 times the speed of a normal Amiga in integer, 3.2 times the speed in floating point!

Small, compact size makes it the smallest accelerator yet

- Only 3 1/8" x 4 1/4" x 1/2" total size!

Not a pseudo accelerator, but a true 32 bit accelerator card using 32 bit processors!

A full, one year warranty!



Workbench Management System

Only \$44.95

The Workbench Management System (WMS) is a revolutionary idea in software for the Amiga! WMS is based on a button concept where a simple click of a button launches your applications!

"WMS is one of the most simple and elegant systems for using the Amiga that we have seen!" - Amazing Computing - August 1990

Eight pre-programmed buttons including a text editor, calendar w/reminder, phone book with dial, and more!

UNLIMITED programmable buttons!

Buttons can be assigned to any application on a floppy, hard drive, or network!

Launches multiple programs as fast as you can click - no longer do you have to wait for application to load!

Free updates to all registered users - First major upgrade is also free!

Memory Challenge Series 1

Now only \$39.95

Memory Challenge is a new educational system for children ages 3 and up which helps teach memory retention and memory recognition! Allows for the use of our supplementary data disks. It also allows parents to configure and enhance the program for their child's specific needs!

Easy to use point and click system - even the hard drive install is built in!

Has many different possible combinations for playability!

The first part of the system has children match the blocks by sight, sound and shape.

The second part of the system lets the children put together the pieces of a picture just like a puzzle!

Has a built in help system in case the child gets stuck putting pieces together!

Allows parents to add their own special winning messages and standard IFF pictures!

MrBackup Professional

Outstanding value at \$54.95

MrBackup is the first full featured backup system for the Amiga utilizing the full potential of the Amiga! With over 60 ARexx™ commands, MrBackup gives the user the power to reach beyond standard backup capabilities! The first full featured hard drive back up system with built in tape drive capabilities.

Will back up to floppy or SCSI streaming tape - tested with Commodore's A2091.

Full ARexx™ integration - Over 60 usable commands!

Utilizes the option to use standard AmigaDOS formats or our own FastDOS format!

Has full built in file compression to save disk space - User selectable!

Uses AmigaDos intuition for full compatibility and ease of use!

User can back up their system to four floppy drives!

System is compatible with versions 1.3 and 2.0 Amiga operating systems!

Brigade!

Great price of \$44.95

A new revolution in gaming software for the Amiga! Most war games work on a turn by turn basis. Brigade brings you another step forward in quality by implementing real time action! Brigade offers excitement not found in other war game simulators. If you do not pay attention, you may lose the battle. You may take a break, but the computer does not. As you issue orders to units, the enemy may be bombarding!

Real-time game play—The action never stops!

Built in scenario/campaign editor— create your own vehicles, weapons, platforms, aircraft, maps, and more!

Oversize map system allows battlefield to be as large as possible!

Full digitized sound and animated weapons firing!

Full control over units, their orders, and missions!

Editor creates maps, unit spec sheets or full scenarios that can be traded with friends.

For more information on these and other exciting products, contact your local dealer or call:

TTR Development, Inc.

1120 Gammon Lane, Madison, WI 53719

608-277-8071 FAX 608-277-8073

Circle 164 on Reader Service Card

Electronic Color Splitter

An inexpensive way to grab quality images off video sources

by Greg Epley

MicroSearch, Inc. has added a new product to their video line. Actually the product isn't entirely new, but is a reengineered version of a former SunRize Industries product. MicroSearch has taken the product and made it better (and raised the price a bit). If you have Digi-View or any similar video digitizer, and are looking for an inexpensive way to grab quality images off video sources such as VCRs or laserdisc players, the Electronic Color Splitter may be just what you're looking for.

This is not strictly a review of the Splitter product. In this article I also include some simple hookup instructions for the Splitter and tips on using the Splitter to achieve the best results with the Digi-View digitizer.

The Splitter is not a video digitizer and it is not a framegrabber. You must own or purchase a video digitizer, and the image you are going to digitize from your video source must not move. For videotape sources, you need a very stable "freeze

frame" which requires a 3- or 4-head VCR. I recommend a 4-head but you might be able to get by with 3; just make sure it has a very stable freeze frame. As far as the digitizer, I use and highly recommend NewTek's Digi-View digitizer.

WHAT YOU GET

The Electronic Color Splitter is enclosed in a small metal box (4.5"W x 1.5"H x 4.5"D). It takes the place of the color wheel normally used with a video digitizer and camera. You must supply a video signal from a VCR or some other stable video source in place of the camera. You also need a video digitizer such as Digi-View. The front of the unit has a single toggle switch for selecting the red, green, or blue portion of the video signal, and two knobs which control hue (color adjustment) and saturation (relative amount of color to brightness). On the back are RCA video inputs for chroma (color) and luma (brightness), an RCA video output which goes to your digitizer, a 9-pin auto

connector whose use we'll cover later, and a power connector.

The Splitter draws its power from an included 15V DC power supply. The only problem I have with this is it's one of those AC-DC wall-type transformers. If you use power strips to handle your equipment like I do, you'll soon find that you can't plug two of those wall-transformers in beside one another, and further, one often blocks a usable outlet. Manufacturers should either do away with them and use a hard-wired plug with the transformer in the equipment or make power strips with more space between the outlets. My unit also included a small "dummy" RCA connector plug which we'll discuss later. The only instructions I could find was a sheet wrapped around the box, and it tells you very little. So my first experience with the Splitter involved a lot of trial and error. Still, this alone isn't reason enough to avoid the product, as you're about to see.

VIDEO STANDARDS, TERMINOLOGY, AND RESULTS

Before we look further at the Splitter we need to discuss video standards, cover a little terminology, and explain why you get the results you do when digitizing from video sources (even with the most expensive equipment).

First, to simplify things, I'm only going to talk about video standards common in the United States. After all, this is an article about the Splitter, not about every video standard in use throughout the world.

There are currently two common video standards in use in the United States; NTSC or "composite" video and S-Video. Both carry the same information in different ways, and it's these differences that make one better than the other. Both carry chroma (color) and luma (brightness) information (or signals). NTSC video combines the color and brightness signals, and

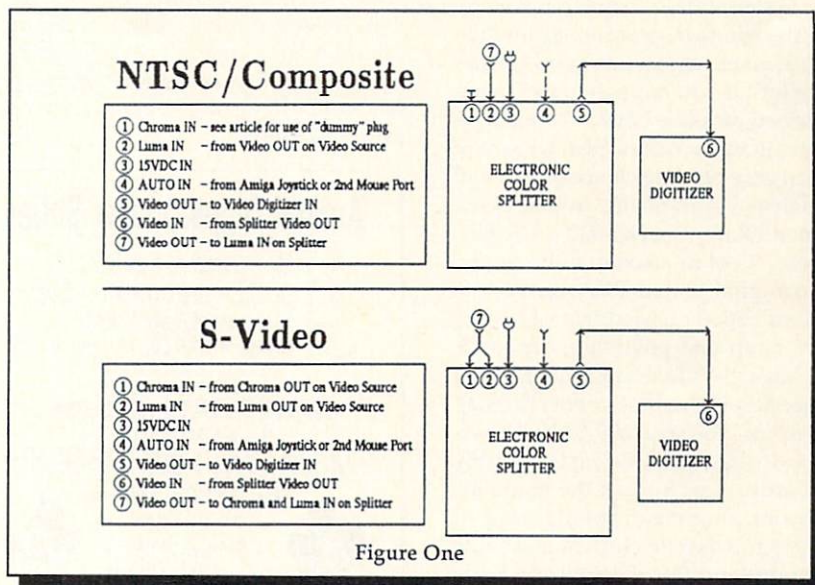


sometimes one signal tends to "bleed" into the other. This signal cross-interference is OK for viewing images but is less desirable for other uses. S-Video, on the other hand, keeps the color and brightness signals separated, and provides a perfect video signal suitable for other uses. You may see the color and brightness signals referred to as "Y/C" signals; "Y" represents a combination of the luminance and sync (luma or brightness, and synchronization) signals and "C" represents the chroma (color) signal. VHS VCR's use NTSC video; S-VHS VCR's use S-Video. There are other video or tape formats that use S-Video, or a variation of it, but I prefer to focus on the more common consumer formats.

Now let's talk about video resolution. Resolution is simply the amount of video information which can be displayed at one time. Resolution is usually specified by the number of lines which can be displayed, or by the number of "pixels" per inch (or square inch). Pixels are "picture elements" or the little dots that make up a video display; a "pixel" is a single dot. If you have been using an Amiga for some time you are probably familiar with another means of specifying resolution; the number of horizontal pixels by the number of vertical pixels, as in 640 x 400 or 352 x 480. There are about 70 pixels per inch displayed in the Amiga's hi-res 640 x 400 mode. A standard color television set can display about 40 pixels per inch. My 4-head VHS VCR can display about 35 pixels per inch. S-VHS VCR's offer somewhere near 50 pixels per inch or better. The black-and-white Panasonic camera recommended for use with Digi-View offers about 600 lines of resolution. The theoretical maximum on the Amiga is about 540. A standard NTSC video source offers 525 lines but the resolution isn't really that good from the standpoint of a video digitizer. A single NTSC video frame (or display) is made up of 525 lines every 1/60th of a second. During the first 1/30th of that 1/60th, the first field of 262.5 lines is displayed with gaps every other line; during the second 1/30th of that 1/60th, the second field of 262.5 lines is "interlaced" or used to fill in the gaps left by the first field. Those 262.5 lines are what your video digitizer sees. The only way around that is a more expensive product which

can capture both fields and combine them into one picture with 525 lines. So for purposes of digitizing off VCR's and laserdisc players that offer NTSC video, the resolution is about 262 lines. Now you can begin to see why images captured with the Panasonic camera (600 lines) look so much better than images captured off a VCR (262 lines). Yes, there are other things

about as good whether you use a 320 pixel Amiga mode or a 640 pixel Amiga mode. You still only see about 35 pixels per inch in either mode; they will be smaller in 320 mode and a bit fatter in 640 mode. The Amiga mode you choose to use depends on the resolution of your video source and on what you are going to do with the final digitized image. Likewise, don't expect



that cause differences in final image quality, but those are beyond the scope of this article.

Now let's try to figure out what all those numbers really mean. Well, obviously the higher the resolution the better your image quality will be. So it's important to get the best resolution you can. The number of colors used in the image is also important. NTSC looks as good as it does because it uses millions of colors and you usually view images from NTSC video sources at some distance. Your eyes blend those millions of colors into "apparently" detailed images. S-Video also uses millions of colors but it also offers higher resolution. NTSC images have "apparent" detail or sharpness; S-Video images have "truer" detail or sharpness. The image your digitizer gets when you grab an image off any video source is dependent on the resolution offered by that source and the number of colors used in rendering the final image. If you digitize an image off a VHS VCR (about 35 pixels per inch), the image you end up with will look

images on a standard Amiga, with an inexpensive digitizer (4,096 colors maximum displayed), to look as good as those on an Amiga with a 24-bit framegrabber or display board (16 million colors displayed).

HOOKING IT UP

Figure One illustrates NTSC/Composite and S-Video hookups for the Splitter. The Splitter has both chroma (color) and luma (brightness) inputs for handling the increasingly popular S-Video standard. I'm sure you'll get some great images with it since S-VHS offers a better resolution over VHS.

For NTSC, you should only use cables specifically labelled "75 ohm" to connect your video source to the Splitter and the Splitter to your digitizer. For S-Video, you don't have to use 75-ohm cables since the signals are fed separately, although I would recommend using the best cables you can find. Audio/video cable is not always true 75-ohm cable. Look for the cable rating on the packaging; if you can't

find it, and don't feel absolutely certain that it is true 75-ohm cable, then please don't buy it! Keep your cable runs as short as possible; 3 feet is preferable; any more and you are risking signal loss or interference with anything less than S-Video. I strongly suggest you avoid F-RCA adapters for standard 75-ohm cables. That's a messy connection and might introduce some interference. If you want to make your own cables, go ahead, but I think it's cheaper to buy them already made. Try to find cables in a discount department or wholesale store rather than a retail store. You'll save yourself some money and the cables are generally just as good (sometimes better). If you happen to run into a streak of bad luck like I did, where everybody seems to be out of just what you need, you may have no choice but a retail store such as Radio Shack. In that case I recommend Radio Shack's #15-1518. This is a 3-foot, 75-ohm coaxial audio/video cable with gold-plated RCA connectors on each end. You will need at least two for NTSC hookup and possibly more for S-Video. Most S-Video equipment either has a special S-VHS connector or chroma/luma outputs. The special S-VHS connector is impossible to find so you'll probably have to order a cable from the manufacturer of your equipment; just make sure it terminates in separate chroma and luma plugs on one end (for the Splitter). From what I've read, more manufacturers are using RCA or BNC chroma/luma outputs on their equipment instead of the special S-VHS connector. If you're buying S-Video

equipment look for RCA connectors; they're much easier to buy for. You might also try the S-View cable from Software Sensations; this is an 8-foot S-Video cable which can be used with many Amiga S-Video compatible products. I haven't seen an S-View cable so I don't know what kind of connectors it has.

Make sure you have your video source on and have power applied to the Splitter before starting up your digitizing software. Otherwise you may experience some video synchronization problems. The Splitter doesn't have an on/off switch so you'll have to unplug the wall transformer to turn it off. You don't need to leave the Splitter turned on to use your Amiga, or to use your digitizer if you disconnect it from the Splitter.

Amiga* Digest Video Series**

Tape 1 - Mastering Workbench* and CLI*
Tape 2 - Desktop Publishing with PageStream**
Tape 3 - The Power of AmigaVision*
Tape 4 - Advanced DIP with PageStream 2.0**

Companion disk with each tape

Free Gift with Every Order!!

\$30 each Two \$50 Three \$70 Four \$90

Plus shipping VA res. add 4.5% tax

Orders Only: 1-800-992-GRVP

Grass Roots Video Productions

P.O. Box 10889

Burke, VA 22015

Inquiries: (703) 569-2652

Hours: M-F 10 a.m. - 4 p.m. EST

MasterCard, VISA, Check, MO, COD

Active Duty Military Personnel Receive 10% Discount

Call for free discount coupon and Product Guide

*Trademark of Commodore Business Machines
**Trademark of Soft Logix Publishing Corporation

Circle 112 on Reader Service card.

COLOR RIBBONS & PAPER

Colors: Black, Red, Blue, Green, Brown, Purple, Yellow

Ribbons: price each	Black	Color	T-Shirt Ribbons
Brother 1109	\$4.95	\$5.95	\$ 7.00
Citizen 200/GSX 140	4.50	5.50	7.50
Citizen GSX 140, 4-Color			
Epson MX/FX/RX80/85	3.75	4.50	6.75
Okidata 182/192	5.50	7.50	6.00
Panasonic 1190/1124	5.75	7.75	
Commodore MPS	Call	For	Price
Star NX1000	3.75	4.75	6.75
Star NX1000, 4-Color		6.75	10.00

T-Shirt (Heat Transfer) Ribbons

Colors: Black, Red, Blue, Green, Brown, Purple, Yellow

COLOR PAPER

Color Paper	200 sheets assorted	
Bright Pack:	9 1/2 x 11	\$10.90/pk
Pastel Pack:	9 1/2 x 11	\$ 8.90/pk
Color Certificate Paper:	100 sheets	\$ 9.95/pk
Color Banner Paper:	45 ft./roll	\$ 8.95/pk

Min. orders \$25.00. Minimum S&H \$4.00. Call for other ribbons and supplies. Price and spec. are subject to change w/o notice.

RAMAC COMPUTER SUPPLIES

P.O. Box 475, Manteno, IL 60950 U.S.A.

(USA) 800-522-6922 or 815-468-8081

(Canada) 800-621-5444

Circle 120 on Reader Service card.

Hot Out Of The Oven...



Recipe-Fax 2.0

**With Complete Recipe Editing
Environment, Serving Adjustments,
Shopping List, Unit US/Metric
Conversion, Printing . . . \$44.95**
Also available Nutri-Fax, Variety &
Dessert Recipe Disk Cookbooks.
Megiddo Enterprises (714) 683-5666.

Circle 144 on Reader Service card.

an NTSC source they look "washed out" without the plug. The hue and saturation controls on the Splitter let you eliminate some of this "washed out" look; however, I prefer to leave these controls in their central positions. I've also found that I can't simply substitute another "dummy" plug of my own. All I do know is that it works and I get good images consistently.

GREAT OUTPUT

You may find, as I did, that images digitized in any of the Amiga's overscan modes exhibit a horizontal band of interference about 12-15 pixels high across the very top of your picture. Since this band doesn't show up when displaying these images with software that properly handles overscan, it's not a serious problem. I bypassed the Splitter and found no change. I didn't have another stable video source to try with the Splitter, so the band may have something to do with the vertical adjustment in the video source.

SOME HINTS FOR DIGI-VIEW OWNERS

Your digitizer's software controls may vary, but I can offer some tips for Digi-View owners. The "camera" requester has selections you will probably find yourself using quite often. The "position" slider can be used to make slight adjustments so that the picture you pick up looks approximately the same as the one from your video source. I monitor my VCR's output on a television set and use some objects near the edges of the picture



FOR NEW AMIGA USERS

Ages 4 to 7

Learn the Alphabet and Have Fun
Animation, Pictures, Letters, and Song

\$30.00

Check or COD - Maryland Residents Add 5%

Dealer Inquiries Welcome

PARTH GALEN

6281 Trotter Road, Clarksville, Maryland 21029

(301) 531-3527

Circle 115 on Reader Service card.

as guides for the image on my monitor from the digitizer; just keep making red passes until you get it right. Incidentally, this brings up a point about using your VCR as a video source. Most VCR's will only stay in pause (freeze frame) for 5 minutes to prevent damage to the tape or the VCR heads. That means you must work quickly. Even working as rapidly as possible, I find it impossible to grab a Dynamic hi-res 704 x 480 color image from my VCR due to the 5 minute time limit. Vertical "position" adjustments have very little effect; horizontal adjustments are clearly evident. If you notice a fuzzy vertical area in your image when making your red pass, you can use the "tracking" slider to get rid of it; experience seems to be the best way to deal with it. Make sure that you have any tracking controls on your video source properly adjusted first. You will want to use the "Slow/Color Camera" capture mode for your final images although, just as with the Panasonic camera, you may find that "normal scan" works fine sometimes, and some digitizing modes won't let you use the slow scan.

I currently digitize exclusively off tape from a 4-head VCR video source. The tips below are for VCR's but some apply to camcorders as well. Anything I can get on tape can be digitized with good results provided a few precautions are taken:

(1) Make sure the video heads of your machine are clean. Scotch, for one, markets an inexpensive cleaning tape that lasts for 20 years of normal cleaning.

(2) Pre-recorded movies or other store-bought videos are mass duplicated and may contain some anti-copying scheme. Not the best choice for material if you can record the part you need off a cable movie channel or use a laserdisc of the pre-recorded material.

(3) Stick with one brand of tape. I use the inexpensive Scotch EG brand. You do not need those so-called "premium" or "top grade" tapes, and in buying them, you are only wasting your money (see the report on "Video Tapes" in the September 1990 issue of *Consumer Reports*). The main thing is to stick to one brand of tape.

(4) Record material in the two-hour SP mode, preferably on a new tape or one that hasn't been used repeatedly.

Memory Management, Inc.

Amiga Service Specialists

Over four years experience!

Commodore authorized full service
center. Low flat rate plus parts.

Complete in-shop inventory.

Memory Management, Inc.

396 Washington Street

Wellesley, MA 02181

(617) 237 6846.

Circle 186 on Reader Service card.

(5) Tracking adjustment is critical to good VCR digitizing. The following tracking adjustment works on 4-head VCRs that have a double-speed play and separate tracking controls for both the VCR and slow-motion. Most 4-head VCRs have these controls but may refer to them differently. In double-speed (sometimes called x2) play mode, adjust the VCR tracking so there is very little or no distortion in the picture. Now go to slow-motion play and adjust the slow-motion tracking control till you just begin to see distortion at the top of the picture, then adjust it in steps till you just begin to see distortion at the bottom of the picture, keeping count of the number of steps. Divide that number in half and adjust the slow-motion tracking up in that number

of steps. Make sure you keep count of the number of adjustment steps required between distortion at the top of the picture and distortion at the bottom of the picture. Halving this and adjusting back towards the middle gets as close as possible to the same tracking set when the tape was originally recorded.

6. Keep tapes wound to the end, and rewind them to the beginning before using. This resets the tape tension and prevents tape breakage. Periodically you should rewind and forward your tapes to eliminate the possible matting of the cassette. Store tapes upright, never on their side, and always in a case. These suggestions should keep your material in good condition for several years should you want to use it again later. Sometimes you'll follow every one of the above steps and still end up with poor images. This can be due to any number of factors: possibly a bad tape, possibly the weather conditions (humidity, temperature, etc.), possibly a damaged part or cable, or possibly some interference introduced when you recorded the material on tape. Also you must remember that images with fine detail, which look great moving on your television screen, may not look as good standing still on your Amiga's monitor. In most circumstances you are seeing the lower resolution of your video source close-up with fewer colors than normal.

You may be wondering what that 9-pin connector on the back of the Splitter is for. MicroSearch sells a separate product called the Digitize Auto Cable which con-

Ham It Up! (v. 1.02)

▲ Sixteen 256-color charts with RGB/CMY values take the guesswork out of color selection

▲ Expanded "Blender" blends & saves more color palettes fast!

▲ Works with DigiPaint™ and DeluxePaint™

◆ Introducing... New!
HamItUp! Clip Art
Backgrounds, gradients, textures created with HamItUp!'s smooth blends.



Displays and prints all 4096 Amiga colors!

\$29.95* for HamItUp! Clip Art, Vol.1 (3-disk set)
\$39.95** for HamItUp! (both include U.S. shpg.)

Call or send a check or money order to:

▲ Delta Graphics ▲ 48 Dighton St.
Brighton, MA 02135 ▲ (617)254-1506

Mass. residents add: *\$1.50 or **\$2.00 sales tax
Dealer Inquiries welcome

Circle 118 on Reader Service card.

SO YA WANNA WORK WITH VIDEO... YOU CAN DO IT!

YOU'VE READ ABOUT IT MONTH
AFTER MONTH, BUT WHAT DOES IT
REALLY TAKE TO GET INTO THE
VIDEO FIELD WITH YOUR AMIGA?

WHAT EQUIPMENT WILL YOU NEED?

WHAT WILL YOUR INITIAL
INVESTMENT COST?

ALL OF THESE QUESTIONS ARE
ANSWERED SO YOU KNOW
ABSOLUTELY EVERYTHING YOU
NEED TO KNOW TO GET STARTED,
AND GET JOBS!

THIS LENGTHY VIDEOTAPE LETS YOU
KNOW WHICH SOFTWARE WORKS
THE BEST, WHAT HARDWARE IS
NECESSARY, AND HOW TO USE IT.
COMPILED BY A WORKING
HOLLYWOOD VIDEO TEAM, THIS
TAPE SHOWS YOU THE BEST
TECHNIQUES FOR ALL ASPECTS OF
VIDEO.

MOST IMPORTANTLY, WE SHOW YOU
HOW TO MARKET YOUR SERVICES SO
YOU CAN BE PROFITABLE!

INFO-PACKED VIDEOTAPE
FOR WORKING IN
PROFESSIONAL VIDEO

ONLY \$19.95 EACH-\$34.95 FOR BOTH

PLEASE ADD \$2.50 PER VIDEO FOR SHIPPING & HANDLING

ATTENTION: DIGITIZERS! IMPROVE YOUR IMAGES!!

FINALLY A LOW COST INSTRUCTIONAL
VIDEO FOR YOUR DIGITIZER!

THIS TAPE COVERS EVERYTHING
FROM CAMERA & LIGHTING
PLACEMENT, TO USING YOUR FINISHED
DIGITIZATIONS WITH YOUR FAVORITE
PAINT PROGRAM.

LEARN TO IMPORT YOUR
DIGITIZATIONS INTO 2-D AND 3-D
ANIMATION PROGRAMS AND REALIZE
THE FULL POTENTIAL OF YOUR
AMIGA!

ACHIEVE PROFESSIONAL RESULTS
USING THE KEY TECHNIQUES NOT
EVEN COVERED IN THE MANUAL!

SECRET SOFTWARE TIPS PREVIOUSLY
UNMENTIONED WILL BRING YOUR
DIGITIZATIONS LIGHT YEARS AHEAD!

USE YOUR DIGITIZER TO MAKE
MONEY! ALL METHODS ARE
DISCUSSED IN DETAIL SO YOU CAN GET
STARTED!

MAKE THE MOST OUT OF YOUR
DIGITIZING INVESTMENT!

INFO PAKED VIDEOTAPE
FOR PROFESSIONAL
DIGITIZING

20 DISKS PACKED FULL OF VIDEO EFFECTS FOR UNDER \$90!

20 DISKS OF THE MOST BEAUTIFUL
ANIMATIONS AND BORDERS EVER
CREATED FOR VIDEO. ALL UTILIZING
COLOR ZERO SO YOU CAN ACHIEVE
BROADCAST QUALITY VIDEO EFFECTS.
WATCH PEOPLES EXPRESSIONS AS THEY SEE
YOUR NEW VIDEO CAPABILITIES!
TURN BORING SEGMENTS INTO THE MOST
EXCITING VIDEOS YOU HAVE EVER
PRODUCED!

20 DISKS TO CHOOSE FROM, SO YOU WILL
NEVER HAVE A HARD TIME FINDING AN
EFFECT THAT IS PERFECT FOR YOUR SCENE.
INCLUDES IMPORTANT VIDEO UTILITIES, AND
REFERENCE CHARTS. THERE IS ALSO AN IN-
DEPTH MANUAL COVERING THE ASPECTS OF
EACH AND EVERY EFFECT!

**PLUS: A VIDEOTAPE COVERING
ALL OF THE VIDEO EFFECTS, FREE
WITH YOUR ORDER.**

"IF YOU USE YOUR AMIGA WITH VIDEO,
YOU CAN'T DO WITHOUT THIS SET OF
SOFTWARE!"
(1 MEG VERSION OR 2+ MEG VERSION)

ONLY \$89.95

PLEASE ADD \$6.00 FOR SHIPPING & HANDLING

**VISA/MC
CHECK
M.O. - C.O.D.**

FOR ORDERS & INFORMATION CALL:

(213) 874-7404

YOU CAN FAX US AT - (213) 874-9460

OR YOU CAN SEND YOUR ORDERS TO:

**MICHAELANGELO PRODUCTIONS
1755 EL CERRITO PLACE #403
LOS ANGELES, CA. 90028**

Circle 127 on Reader Service card.

nects between your joystick (or second) mouse port and the auto connector on the Splitter. With this hookup you can select the "Auto" digitize option from Digi-View for painless automatic digitizing. This would also cut down on the wear and tear on the toggle switch on the front of the Splitter. The literature I received on the cable makes the claim that the cable will "cut your color digitizing time in half". The literature also says that the cable is "an electronic assembly" which hints that you can't simply make one with your own 9-pin cables (although for \$49.95 I'm inclined to try). I've seen some amazing progress with Amiga products but, unless MicroSearch has found some way to physically speed up your digitizers' scan speed, I'm skeptical of this claim. Your digitizing speed is ultimately tied to the digitizers' scan speed and not to this cable or the Splitter. To be fair to MicroSearch, this is my personal opinion, and is in no way intended to discourage anyone else from buying the cable. Frankly I'd rather spend the \$49.95 for a good game or something else and replace the RGB switch on the Splitter when it wears out.

CONCLUSIONS

The Electronic Color Splitter is an economical way to add the capability to digitize from a stable video source with the inexpensive digitizers in wide use. As long as true 75-ohm video cables are kept short for all connections the best possible results can be achieved. The lack of any instructions for hooking the unit up or

using it is a nuisance, as is the wall-type power supply. Otherwise, the unit appears well-shielded, and delivers what MicroSearch promises. If you already own a video digitizer, or if you're just looking for something to get the job done on a tight budget, you can't beat the price and performance of the Electronic Color Splitter.

•AC•

PRODUCTS MENTIONED:

Digitize Auto Cable
Price: \$49.95
MicroSearch, Inc.
9896 Southwest Freeway
Houston, TX 77074
(713) 988-2819
Inquiry #216

Electronic Color Splitter
Price: \$149.95
MicroSearch, Inc.
9896 Southwest Freeway
Houston, TX 77074
(713) 988-2819
Inquiry #217

Digi-View
Price: \$199.95
NewTek, Inc.
215 SE Eighth Street
Topeka, KS 66603
(913) 354-1146
Inquiry #218

S-View
Price: \$79.95
Software Sensations
1441 Robertson Blvd.
Los Angeles, CA 90035
(213) 277-8272
Inquiry #219

(Show Reports, continued from page 24)

questions on what the Amiga can do. The answers are pieces prepared by CBM executives and third-party officials specializing in different areas of the Amiga.

VidTech representatives flew from Köln, Germany to Las Vegas for COMDEX. They occupied one area in Commodore's booth to demonstrate the graphics capabilities of their new VideoMaster. VideoMaster is a video control box with genlock and RGB color splitting included. VideoMaster includes a special effects generator with vertical interval switching, dissolves, and wipes. Priced at \$1295, VidTech believes, "VideoMaster integrates in a single system all the functions necessary to transform the Amiga computer into a fully featured multimedia workstation without the use of the video slot."

The Colwell/General Inc. paint system kiosk was on display, showing how easily the color scheme for the home of your dreams could be generated in any paint store.

NewTek, Supra Corporation, Precision Inc., XYXIS Corp, and Konyo International (Golden Image) all had their own company booths in other parts of the exhibition.

Also, at the Riviera, was Scan Trac, a new device for making handscanners easier to use. Scan Trac, by Technology Enhancement Group, is a clear plastic track and holder for almost any standard hand scanner that will allow the user smooth and complete control over the scanning of any flat surfaced document. Priced at \$39.95, Scan Trac is a relatively inexpensive addition to anyone's Amiga graphics tool list.

Toronto,
Canada



Once again, The World Of Commodore Amiga in Toronto (November 30 to December 2) was the biggest North American event of the year. With a full curriculum of seminars and self-help clinics, as well as a schedule of special product demonstrations held throughout the three-day event, WOCA provided the 32,000 attendees with a powerful exhibition. Dealer sales were extraordinary, with many items having sold out by the middle of the second day of the show. Commodore Business Machines established an

on-site warehouse to keep dealers stocked with Amigas. It worked. One dealer sold 72 Amigas in just the first two days.

WOCA began with a press breakfast on the first day of the event. After a few short remarks by Commodore Canada's departing President, James Dionne and an introduction of the new President, James McWhinnie, the meeting was moved to Commodore's large exhibition area on the show floor. Nolan Bushnell, General Manager of the Consumer Products Division at CBM demonstrated CDTV for the first time to a large audience. Commodore Canada used WOCA to publicly announce and demonstrate the capabilities of CDTV. Over the next three days, Commodore personnel demonstrated CDTV and answered questions from interested attendees.

CDTV (Commodore Dynamic Total Vision) is an interactive multimedia player that combines compact disc technology with an Amiga in a black audio/video component-style box [please see related article in the July, 1990 issue of *Amazing Computing*]. All input can be handled directly

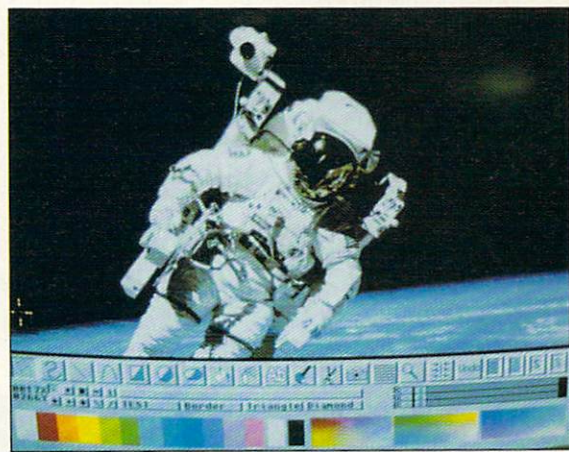
through a specially designed remote control. The player connects directly to a television set. Tom Shepherd, director of marketing at CBM Canada said, "CDTV is the next logical step in the evolution of consumer electronics. It provides capabilities far beyond any currently available entertainment or computer system, yet is remarkably simple to use. If you know how to change TV channels with a remote control, you can take full advantage of CDTV." Mr. Shepherd, as well as a great many other CBM executives, spent a good deal of time at WOCA demonstrating CDTV and answering consumers' questions.

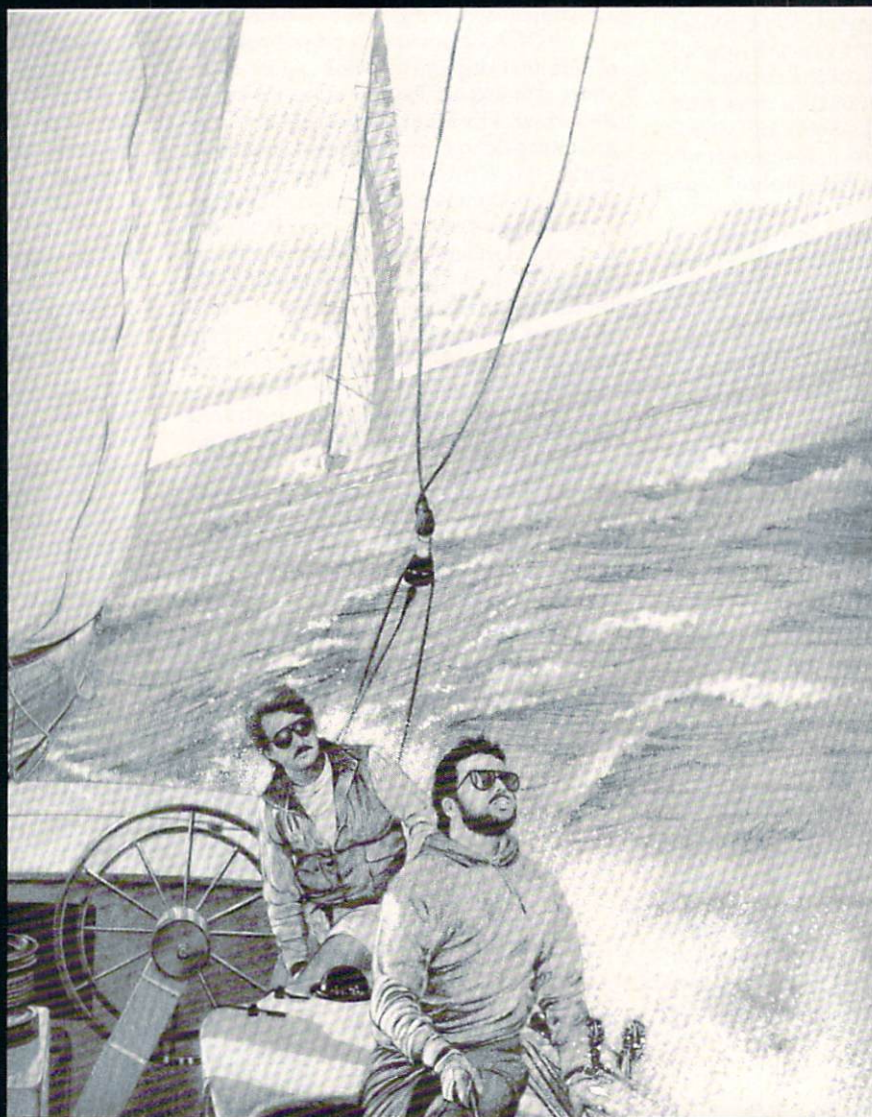
With 35 titles promised for the product launch early this year [see *AC's interview with Nolan Bushnell on page 96*], CDTV will be a viable entertainment and educational system for the coming year.

Gold Disk demonstrated ShowMaker and the rest of their full line of Amiga products, while quietly showing a new software product, HyperBook, clearly aimed at the hypermedia and cardstack market for the Amiga. HyperBook is a hypertext product with extensive ARexx

right: Lake Forest
Logic's Macro Paint
takes Amiga art to
new heights.

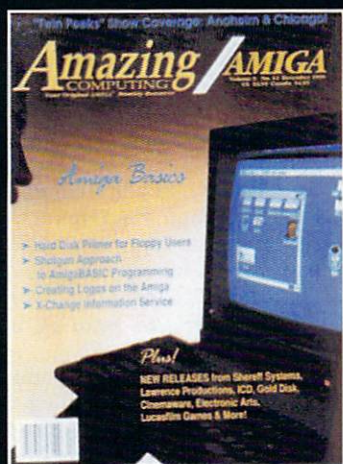
below: Intensity
reflects in the faces of
those gathered to see
Disney's Animation
Studio in action.





**Are you the type of person who
needs a really good reason to
subscribe to a magazine?**

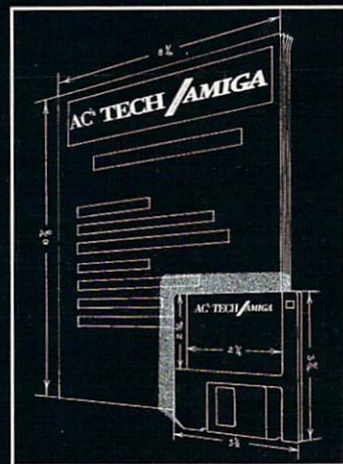
Only the "Amazing" AC family of Amiga publications gives you 3 great reasons to subscribe!



REASON #1



REASON #2



REASON #3

You are not an ordinary Amiga user. Don't subscribe to an ordinary Amiga magazine. Join the AC subscriber family today!

Now there are 6 great ways to join the AC family, too! Start off with a one- or two-year subscription to *Amazing Computing*, Your Original AMIGA Monthly Resource. Or, add *AC's GUIDE*, the best and most complete Amiga product and information guide in the world, with a one- or two-year AC SuperSub. Finally, explore all things technical with *AC's TECH* - check out the premiere January issue, or take advantage of the limited time Charter Subscription Offer! Just use one of the new subscription cards in this issue, or call 1-800-345-3360 with your credit card order!

controls. HyperBook's full text formatting controls include left, right, center, justified, spacing, and leading and can be used on a single letter in a paragraph. Extensive drawing tools have also been created to make designing your cards very easy. IFF pictures can be imported and manipulated for various uses including buttons. HyperBook promises to be a very nice program for the burgeoning hyperactive authoring market, and is due from Gold Disk in the first quarter of this year.

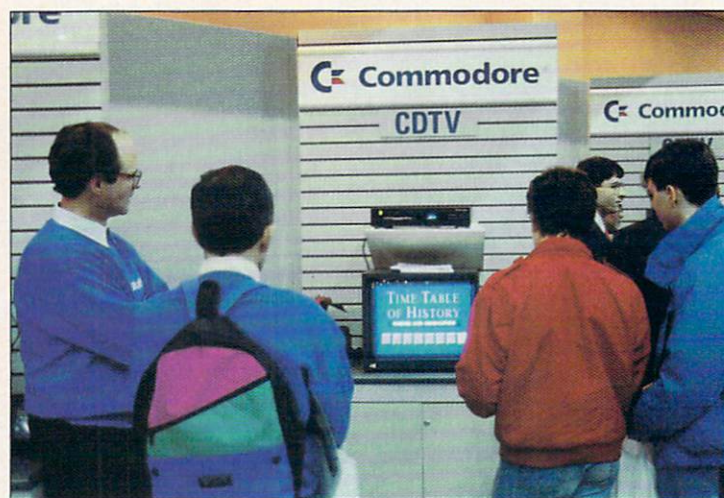
Lake Forest Logic's new MacroPaint was available for the first time at WOCA.

Spirit Technology announced BYTE 'N' BACK as the "world's fastest hard drive backup utility." BYTE 'N' BACK is available directly from Spirit Technology for \$69.00.

TTR Development began shipping what promises to be a long list of new and diverse software. Workbench Management System V2.0, the newest update to their popular WMS, contains eight built-in applications, an unlimited amount of programmable buttons, quick access time, and full Workbench 2.0 compatibility for \$49.95.



A young Amiga user tests her ability at TTR's Memory Challenge.



Tom Sheperd (right) of CBM introduces attendees to CDTV.

This new high-resolution paint system is a real eye-catcher. At \$139.95, MacroPaint's 4096-color displays drew more than a few people to their booth.

Soft-Logic announced PageStream V2.1. V2.0 users will automatically be upgraded to V2.1; however, registered users of PageStream versions prior to V2.0 will be charged \$75 to upgrade.

For children, TTR created the educational game Memory Challenge which requires memory skills in matching squares to uncover a puzzle beneath. Memory Challenge utilizes the Amiga's speech capabilities to help children learn. Parents are encouraged to help their children learn by editing the reward files and creating their own speech statements (\$39.95).

TTR continued with the announcement of the Teacher's Toolkit, available for \$49.95. Teacher's Toolkit is a system for educators to manage time and students. This grade book system allows a teacher to make changes, keep notes, manipulate data, create graphs and more, while also providing the teacher with a built-in lesson planner.

In the game department, TTR released Brigade, a real-time war simulation that does not wait for you to make your move. All action is taking place simultaneously on the board. With a built-in editor and other features, Brigade (\$44.95) is not for the slow and steady strategist. TTR also announced a series of new BattleTech Battleware modules. This series of modules allows users to create an entire universe of new BattleTech warriors.

TTR's most important advancement for Amiga users with disk drives was MRBackup Professional. Backups are permitted to floppy, hard drive, SCSI streaming tape, virtual file, etc. Priced at \$54.95, MRBackup will work with your existing SCSI controller and most SCSI streaming tape drives.

ATonce is a new PC/AT emulator from Talon Technology, Inc. that fits in the memory expansion slot of the Amiga 500. Due out this month, the ATonce board allows A500 users to partition hard drives for IBM PC use. Installation requires no soldering. ATonce can also be used by Amiga 2000 owners with the addition of a special adapter. At \$299, ATonce may be the best answer some users can find for IBM-PC emulation.

In the graphics area, Walt Disney Computer Software demonstrated animation techniques with their new Animation Studio. New Horizons continued to demonstrate the features and answer questions regarding their new structured drawing program, Graphic Designer.

On the first night of the exposition, Commodore presented a special developers conference to keep developers current on the software tools now available through CATS. Jeff Scherb and Gail Wellington were present to introduce the assembled developers to the new products CBM is making available. Carolyn Scheppner was superb as she deftly went through the large amount of development tools she has been able to collect and distribute through the CATS program.

Wayne Beyea did not attend this year's developers meeting as he was too busy running around the exhibition hall assisting everyone. However, Wayne insisted that we place his name somewhere in this report. It is only fitting: he and everyone else involved with this show did a superb job.—Ed.



Companies Mentioned & The World Of Commodore Amiga Exhibitors

Abacus
Grand Rapids, MI 49512
616-698-0330
Inquiry #259

Account-Ability
P.O. Box 167
Norval, Ont. L0P 1K0
416-454-8544
Inquiry #260

Activa International B.V.
Keulenweg 95
1101 GE Amsterdam
Int +31 20 97 00 35
Inquiry #257

Amiga Centre Scotland
4 Hart Street Lane
Edinburgh, Scotland EH1
3RN
44 (0)31 557 4242
Inquiry #305

Amiware
3180 Steeles Ave. E, Ste. 216
Markham, Ont. L3R 4G9
416-931-8760
Inquiry #261

Applied Engineering
P.O. Box 5100
Corroton, TX 75011
214-241-6060
Inquiry #307

Blue Ribbon SoundWorks
1248 Clairmont Road
Suite 3D
Atlanta GA 30030
404-377-1514
Inquiry #308

California Access
130A Knowles Dr.
Los Gatos, CA 95030
408-378-0340
Inquiry #263

Canada Remote Systems
1331 Crestlawn Dr., #D
Mississauga, Ont. L4W 2P9
416-620-1439
Inquiry #264

Commodore Business
Machines, Inc.
3470 Pharmacy Ave.
Agingcourt, Ont. M1W 3G3
416-499-4292
Inquiry #265

Commodore Business
Machines, Inc.
1200 Wilson Drive
West Chester, PA 19380
416-499-4292
Inquiry #265

Computer & You
5230 Dundas St. W
Toronto, Ont. M9B 1A8
416-231-0205
Inquiry #267

Computer Express
7050A Bramalea Rd.,
Unit #13
Mississauga, Ont. L5S 1T1
416-672-5595
Inquiry #268

Computer Odyssey, Inc.
1186 Stone Church Rd. E
Hamilton, Ont. L8W 2C7
416-574-1401
Inquiry #269

Computer Variables
1535 Bayview Ave.
Toronto, Ont. M4G 3B5
416-481-6807
Inquiry #270

Comspec Systems
74 Wingold Ave.
Toronto, Ont. M6B 1P5
416-785-3553
Inquiry #271

Creative Micro Designs
50 Industrial Dr.
East Long Meadow, MA 01028
413-525-0023
Inquiry #272

Datamax Research Corp.
809-77 Finch Ave. E
Toronto, Ont. M2N 6H8
416-250-7424
Inquiry #273

Digital Creations
2865 Sunrise Boulevard, Suite 103
Rancho Cordova, CA 95742
916-344-4825
Inquiry #309

Digital Vision Software Design Group
M Hus
N-2380 Brumunddal, Germany
00 47/65/4 30 19
Inquiry #258

Disks & Labels To Go
Rte. 206, East Hampton Business Park
Mt. Holly, NJ 08060
609-265-1500
Inquiry #274

Ditek International
2651 John St.
Markham, Ont., Canada L3R 2W5
416-479-1990
Inquiry #310

Dr. T's Music Software, Inc.
220 Baylston St. #306
Boston MA, 02167
617-244-6954
Inquiry #311

Electronics 2001 Ltd.
4744 Yonge St.
Willowdale, Ont. M2N 5M6
416-229-2700
Inquiry #275

Electronic Zoo
3431-A Benson Ave.
Baltimore, MD 21227
301-646-5031
Inquiry #276

Erm Inc.
37 Washington St.
Melrose, MA 02176
617-662-9363
Inquiry #277

First Call Computer Accessories
410 Adelaide St. W Ste. #305
Toronto, Ont. M5V 1S8
416-360-7628
Inquiry #278

Free Spirit Software
P.O. Box 128, 58 Noble St.
Kutztown, PA 19530
215-683-5609
Inquiry #279

Gold Disk, Inc.
5155 Spectrum Way, Unit 5
Mississauga, Ont. L4W 5A1
416-602-4000
Inquiry #280

Great Valley Products
600 Clark Ave.
King of Prussia, PA 19406
215-337-8770
Inquiry #281

ICD, Inc.
1220 Rock Street
Rockford, IL 61101
815-968-2228
Inquiry #312

Interactive Video Systems
7245 Garden Grove Blvd., Ste. E
Garden Grove, CA 92641
714-890-7040
Inquiry #313

Kawal Canada Music
6400 Shawson Dr.
Mississauga, Ont. L5T 1L8
416-670-2345
Inquiry #282

Konyo International, Inc.
1073 North Batavia Street, Suite B
Orange, CA 92667
800-356-5178
Inquiry #314

Lake Forest Logic, Inc.
28101 Ballard Rd., Unit 3
Lake Forest, IL 60045
708-816-6666
Inquiry #283

M.A.S.T. Memory and Storage
Technology, Inc.
1395 Greg Street
Sparks, NV 89431
702-359-0444
Inquiry #315

Memory World
2476 Croyden Ct.
Bensalem, PA 19020
215-741-6225
Inquiry #285

Merit Software
13635 Gamma Rd.
Dallas, TX 75244
214-385-2353
Inquiry #286

Migraph, Inc.
200 S. 333rd St., Ste. 220
Federal Way, WA 98003
206-828-4677
Inquiry #287

Mindware International
110 Dunlop St. W. Box 22158
Barrie, Ont. L4M 5R3
705-737-5998
Inquiry #288

New Horizons
206 Wild Basin Rd.
Austin, TX 78746
512-328-6650
Inquiry #289

NewTek
215 E. 8th St.
Topeka, KS 66603
913-354-1146
Inquiry #316

North American Software Distributors
33 Alliance Blvd., Unit 1
Barrie, Ont. L4M 5K2
705-737-5279
Inquiry #290

NTC Software
19 Passmore Ave. #8
Scarborough, Ont. M1V 2R6
416-292-9000
Inquiry #291

OXI/Aegis Development
1339 E. 28th Street
Long Beach, CA 90806
213-427-1227
Inquiry #317

Parsec, Inc.
P.O. Box 111
Salem, MA 01970
617-592-1738
Inquiry #292

Precision Software, Inc.
8404 Sterling St. Suite A
Irving, TX 75063
214-929-4888
Inquiry #318

Pre'spect Technics, Inc.
1085 St. Alexandre, Ste. 500
Montreal, PQ H2Z 1P4
514-954-1483
Inquiry #293

Pulsar International
414 Maple Ave.
Westbury, NY 11590
516-997-6707
Inquiry #294

Seven Seas software, Inc.
P.O. Box 1451
Port Townsend, WA 98368
206-385-1956
Inquiry #295

Sierra On-Line
P.O. Box 485
Coarsegold, CA 93644
209-683-3472
Inquiry #296

Soft-Logik Publishing Canada
Box 206
Whitby, Ont. L1M 5S1
416-668-1468
Inquiry #297

Softscape
3044 Bloor St. W
Etobicoke, Ont. M8X 1C2
416-233-3524
Inquiry #298

Spirit Technology
8345 E. Fifth Pl.
Tulsa, OK 74112
918-834-2509
Inquiry #299

Supra Corporation
1133 Commercial Way
Albany, OR 97321
800-727-8772
Inquiry #319

Talon Technology, Inc.
243 N. Highway 101, Suite 11
Solana Beach, CA 92075
(619) 792-6511
Inquiry #322

Technology Enhancement Group
2710 N. Berkley
Orange, CA 92665
Inquiry #321

Thornhill Computers
7323 Yonge St.
Thornhill, Ont. L3T 2B2
416-886-2494
Inquiry #300

T.T.R. Development
1120 Gammon Ln.
Madison, WI 53719
608-277-8071
Inquiry #302

Utilities Unlimited
15 Kappele Circle Unit #7
Stratford, Ont. N5A 5M1
519-271-6082
Inquiry #303

VidTech International, Inc.
2822 NW 79th Avenue
Miami, FL 33122
305-477-2228
Inquiry #320

Walt Disney Software
270 Rexdale Blvd.
Etobicoke, Ont. M9W 1R2
416-743-5552
Inquiry #304

Xetec, Inc.
2804 Arnold Rd.
Salina, KS 67401
913-827-0685
Inquiry #305

AC Disks

Source code and executable programs included for all articles printed in *Amazing Computing*.

- 1 AC V3.8 and V3.9**
Gels in MultiForth Parts I & II: Learn how to use Gels in MultiForth. Author: John Bushakra
FFP & IEEE: An Example of using FFP & IEEE math routines in Modula-2. Author: Steve Fairwieszewski
CAI: A Computer Aided Instruction program with editor written in AmigaBASIC. Author: Paul Castonguay
Tumbler's Tots: A complete game written in Assembly language. Save the falling babies in this game. Author: David Ashley
VGad: A gadget editor that allows you to easily create gadgets. The program then generates C code that you can use in your own programs. Author: Stephen Vermeulen
MenuEd: A menu editor that allows you to easily create menus. The program then generates C code that you can use in your own programs. Author: David Pehrson
Bspread: A powerful spread sheet program written in AmigaBASIC. Author: Bryan Catley
- 2 AC V4.3 and V4.4**
Fractals Part I: An introduction to the basics of fractals with examples in AmigaBASIC, True BASIC, and C. Author: Paul Castonguay
Shared Libraries: C source and executable code that shows the use of shared libraries. Author: John Baez
MultiSort: Sorting and intertask communication in Modula-2. Author: Steve Fairwieszewski
Double Playfield: Shows how to use dual playfields in AmigaBASIC. Author: Robert D'Asto
'861 Math Part I: Programming the 68861 math coprocessor chip in C. Author: Read Predmore
Args: Passing arguments to an AmigaBASIC program from the CLI. Author: Brian Zupke
- 3 AC V4.5 and V4.6**
Digitized Sound: Using the Audio device to play digitized sounds in Modula-2. Author: Len A. White
'861 Math Part II: Part II of programming the 68861 math coprocessor chip using a fractal sample. Author: Read Predmore
At Your Request: Using the system-supplied requestors from AmigaBASIC. Author: John F. Weidern
Insta Sound: Tapping sound from AmigaBASIC using the Wave command. Author: Greg Stringfellow
MIDI Out: A MIDI program that you can expand upon. Written in C. Author: Br. Seraphim Winslow
Disksell Compiler: Setting up a compiler environment that doesn't need floppies. Author: Chuck Raudonis
- 4 AC V4.7 and V4.8**
Fractals Part II: Part II on fractals and graphics on the Amiga in AmigaBASIC and True BASIC. Author: Paul Castonguay
Analog Joysticks: The code for using analog joysticks on the Amiga. Written in C. Author: David Kinzer
C Notes: A small program to search a file for a specific string in C. Author: Stephen Kemp
Better String Gadgets: How to tap the power of string gadgets in C. Author: John Bushakra
On Your Alert: Using the system's alerts from AmigaBASIC. Author: John F. Weidern
Batch Files: Executing batch files from AmigaBASIC. Author: Mark Aydelotte
C Notes: The beginning of a utility program in C. Author: Stephen Kemp
- 5 AC V4.9**
Memory Squares: Test your memory with this AmigaBASIC game. Author: Mike Morrison
High Octane Colors: Use dithering in AmigaBASIC to get the appearance of many more colors. Author: Robert D'Asto
Cell Animation: Using cell animation in Modula-2. Author: Nicholas Cirasella
Improving Graphics: Improve the way your program looks no matter what screen it opens on. In C. Author: Richard Martin
Gels in MultiForth-Part 3: The third and final part on using Gels in Forth. Author: John Bushakra
C Notes V4.9: Look at a simple utility program in C. Author: Stephen Kemp
1D_Cells: A program that simulates a one-dimensional cellular automata. Author: Russell Wallace
Colourscope: A shareware program that shows different graphic designs. Author: Russell Wallace
ShowILBM: A program that displays lo-res, hi-res, interlace and HAM IFF pictures. Author: Russell Wallace
Labyrinth II: Roll playing text adventure game. Author: Russell Wallace
Most: Text file reader that will display one or more files. The program will automatically format the text for you. Author: Russell Wallace
Terminator: A virus protection program. Author: Russell Wallace
- 6 AC V4.10 and V4.11**
Typing Tutor: A program written in AmigaBASIC that will help you improve your typing. Author: Mike Morrison
Glatt's Gadgets: Using gadgets in Assembly language. Author: Jeff Glatt
Function Evaluator: A program that accepts mathematical functions and evaluates them. Written in C. Author: Randy Finch
Fractals: Part III: AmigaBASIC code shows you how to save/load pictures to disk. Author: Paul Castonguay
More Requestors: Using system calls in AmigaBASIC to build requestors. Author: John Weidern
MultiForth: Implementing the ARP library from Forth. Author: Lonnie A. Watson
Search Utility: A file search utility written in C. Author: Stephen Kemp
Fast Pics: Re-writing the pixel drawing routine in Assembly language for speed. Author: Scott Steinman
64 Colors: Using extra-half-brite mode in AmigaBASIC. Author: Bryan Catley
Fast Fractals: A fast fractal program written in C with Assembly language subroutines. Author: Hugo M. H. Lypkens
Multitasking in Fortran: All the hard work is done here so you can multitask in Fortran. Author: Jim Locker
- 7 AC V4.12 and V5.1**
Arexx Part II: Information on how to set up your own Arexx programs with examples. Author: Steve Gilmor
Leggo My LOGO: A Logo program that generates a Christmas tree with decorations. Author: Mike Morrison
Trees and Recursion: An introduction to binary trees and how to use recursion. Written in C. Author: Forest Arnold
C Notes: A look at two data compressing techniques in C. Author: Stephen Kemp
Animation? BASiCally: Using cell animation with AmigaBASIC. Author: Mike Morrison
Menu Builder: A utility to help build menus in your own programs. Written in C. Author: Tony Preston
Dual Demo: How to use dual playfields to make your own arcade games. Written in C. Author: Thomas Eshelman
Scanning the Screen: Part four in the fractals series. This article covers drawing to the screen. In AmigaBASIC and True BASIC. Author: Paul Castonguay
C Notes: Recursive functions in C. Author: Stephen Kemp
- 8 AC V5.2 and V5.3**
Dynamic Memory! Flexible string gadget requester using dynamic memory allocation. Author: Randy Finch
Call Assembly language from BASIC: Add speed to your programs with Assembly. Author: Martin F. Combs
Conundrum: An AmigaBASIC program that is a puzzle-like game, similar to the game Simon. Author: Dave Senger
Music Titrer: Generates a titler display to accompany the audio on a VCR recording. Author: Brian Zupke
C Notes From the C Group: Writing functions that accept a variable number of arguments. Author: Stephen Kemp
Screen Saver: A quick remedy to prolong the life of your monitor. Author: Bryan Catley
- 9 AC V5.4 and V5.5**
Bridging The 3.5" Chasm: Making Amiga 3.5" drives compatible with IBM 3.5" drives. Author: Karl D. Belsom
Ham Bone: A neat program that illustrates programming in HAM mode. Author: Robert D'Asto
Handling Gadget and Mouse IntuiEvents: More gadgets in Assembly language. Author: Jeff Glatt
Super Bitmaps in BASIC: Holding a graphics display larger than the monitor screen. Author: Jason Cahill
Rounding Off Your Numbers: Programming routines to make rounding your numbers a little easier. Author: Sedgwick Simons
Mouse Gadgets: Faster BASIC mouse input. Author: Michael Fahrion
Print Utility: A homemade print utility, with some extra added features. Author: Brian Zupke
Bio-feedback/Lie detector Device: Build your own lie detector device. Author: John Iovine
Do It By Remote: Build an Amiga-operated remote controller for your home. Author: Andre Theberge
- 10 AC V5.6 and V5.7**
Convergence: Part five of the Fractal series. Author: Paul Castonguay
Amiga Turtle Graphics: Computer graphics and programming with a LOGO-like graphics system. Author: Dylan McNamee
C Notes: Doing linked list and doubly linked lists in C. Author: Stephen Kemp
Tree Traversal & Tree Search: Two common methods for traversing trees. Author: Forest W. Arnold
Exceptional Conduct: A quick response to user requests, achieved through efficient program logic. Author: Mark Cashman
Getting to the Point: Custom Intuition pointers in AmigaBASIC. Author: Robert D'Asto
Crunchy Frog II: Adding windows and other odds and ends. Author: Jim Fiore
Synchronicity: Right and left brain lateralization. Author: John Iovine
C Notes From the C Group: Doubly linked lists revisited. Author: Stephen Kemp
Poor Man's Spreadsheet: A simple spreadsheet program that demonstrates manipulating arrays. Author: Gerry L. Penrose
- 11 AC V5.8, V5.9 and AC V5.10**
Fully Utilizing the 68861 Math Coprocessor Part III: Timings and Turbo_Pixel Function. Author: Read Predmore
C Notes From the C Group 5.8 & 5.10: Functions supporting doubly linked lists, and a program that will examine an archive file and remove any files that have been extracted. Author: Stephen Kemp
Time Out! Accessing the Amiga's system timer device via Modula-2. Author: Mark Cashman
Stock-Portfolio: A program to organize and track investments, music libraries, mailing lists, etc. in AmigaBASIC. Author: G. L. Penrose
CyggCC: An Arexx programming tutorial. Author: Duncan Thomson
Programming in C on a Floppy System: Begin to develop programs in C with just one megabyte of RAM. Author: Paul Miller
Koch Flakes: Using the preprocessor to organize your programming. Author: Paul Castonguay
AudioIllusion: Experience an amazing audio illusion generated on the Amiga in Benchmark Modula-2. Author: Craig Zupke
Pictures: IFF pictures from past Amazing Computing issues.
- 12 AC V5.11, V5.12 & V6.1**
Keyboard Input in Assembly: Fourth in a series of Assembly 68000 programming tutorials. Author: Jeff Glatt
A Shared Library for Matrix Manipulations: Creating a shared library can be easy. Author: Randy Finch
C Notes From the C Group: A discussion on cryptography. Author: Stephen Kemp
ZoomBox: Attaches a zoom box to an Intuition window and allows the user to toggle the window's size and its position. Author: John Leonard

For PDS orders, please use form on page 95. Visa and MasterCard available.

bug bytes

upgrades
fixes
updates
new
releases

by John Steiner

CORRESPONDENCE FROM readers this month includes several EMail letters. George Kerber of Aurora, Colorado writes in regards to problems he has been having with Lake Forest Logic's Disk Mechanic. Specifically, he is having problems with the TuneUp program, a disk defragmentation utility. He notes, "All it seems to do to my disks is to destroy the structure and cause me to reformat and reload." Mr Kerber adds that he wrote two letters which were never answered. After calling numerous times, Lake Forest Logic sent him two upgrades, but the program still doesn't work properly. If you have Disk Mechanic and use the TuneUp program successfully, please let me know what you are doing to make it work for you. I'll pass the information along to Mr. Kerber.

BRAD SCHENCK, AN ARTIST of some renown who works extensively with Amiga graphics and animation, has requested that I mention the fourth annual Bit.Movie computer graphics festival and animation contest, to be held in Italy. The entry deadline is in March and the contest is open to all. Last year, Mr. Schenck believes he was the only American entrant and he writes that they would like to have more American artists participate this year. You may find out more about the contest by contacting *Adriatic Coast Amiga Users' Club*, c/o Carlo Mainardi, via Bologna, n.13, 47036 Riccione, Italy, telefax (0541) 601962.

LELAND HOSFORD writes of some problems with PageStream 2.0. He can replicate one of the problems by following a specific sequence of operations as follows: open PageStream 2.0, select "new" from the "files" menu, create an 8-1/2" x 11" document, select "snap to grid" from the "layout" menu, select "show 200%" from the "view" menu, select the "column" gadget and create a column 1/4" high x 2" wide, select the "text" gadget and enter "a string of text", use <right amiga>-A to "select all", select "fonts/points" from the "style" menu, and change the font to CS Triumvirate-Normal-18.

I passed along the information to Soft Logik via one of their beta testers. If you can either help with this problem or if you cannot duplicate the problem with the above sequence, drop me a line, and I'll pass the information along.

TOM DAIGON WRITES via CompuServe EMail about a problem he is having with MusicX version 1.1. According to Mr. Daigon, "The problem is the new version's inability to transmit sysex info to my sound module. Music-X 1.0 has no problem doing this function." He adds, "Sysex is a way to store info that describes the instruments and their many settings within a track in the sequencer. When the MIDI composition is played back to the sound module, the sysex automatically reminds the synthesizer or sample player what instruments to use and how to con-

figure them. I can boot up version 1.0 and it works like a charm, but not 1.1." He goes on to say that Microillusions is aware of the problem, and has sent him an interim upgrade. He comments however, that the bug still hasn't been fixed. If you have found any workarounds or have a solution to this problem, please let me know.

LAST MONTH I REPORTED on "problems" with AmigaVision and overscanned screens under Workbench 2.0. As it turns out, there was no problem. I have several AmigaVision applications that use overscanned screens which run properly under Workbench 1.3, yet when run under Workbench 2.0, the display gets cut off. The problem in this case was simply my misunderstanding of how Workbench 2.0 handles overscan. It turns out that you must set the maximum overscan height and width from one of the Preferences gadgets and, on the A3000 I have been using, it had never been set large enough to display an entire overscanned screen. Once I discovered and corrected this, AmigaVision displayed fully overscanned screens.

While on the topic of Workbench 2.0, Amiga 3000 dealers have received an upgrade. The single-disk upgrade is Workbench version 2.02, and includes an install script that makes installation of the upgrade rather painless. The upgrade arrived with a letter authorizing dealers to provide a no-charge upgrade to A3000

WE STOCK CONNECTORS

D-SUBS

9-15-19-23-25-37

DINS

3-4-5-6-7-8-13-14

MINI DINS

3-4-5-6-7-8-9

Many other styles also in stock
Ready made and Custom cables
Switch boxes, Fans, Spray Chemicals
IC Sockets, Gender Changers, & more...

CALL OR WRITE FOR FULL CATALOG

BENETECH ELECTRONIC SUPPLY

1655 "B" HICKORY DR.

HOLTOM CITY, TX 76117

1-800-783-8703

Circle 106 on Reader Service card.

owners who request it. Dealers are authorized to charge only a modest fee to cover the cost of any diskettes they provide. *Commodore Business Machines, 1200 Wilson Drive, West Chester, PA 19380, (215) 431-9100. Inquiry #200*

A NOTICE LEFT ON People Link advises Power Pinball users that there is an upgrade available to registered owners. If you are having problems with bumpers vanishing during editing or after creating events with new lights, you should get the upgrade. There is no charge for the upgrade if you send KarmaSoft the original Power Pinball game disk along with a note containing your request for the upgrade and your return address. *KarmaSoft, P.O. Box 1034, Golden, CO 80402, (303) 277-1241. Inquiry #201*

MICROBOTICS HAS RELEASED version 1.9 of the driver for its high-speed HardFrame SCSI interface. The new driver provides improved reliability, greater compatibility with a wider selection of SCSI hard drives, and Workbench 2.0 compatibility. Also included is improved support for removable media such as the Syquest drives. Owners of removable drives can run a new background utility called DCHANGE and platter change activity will automatically be sensed. The driver is shipped on an EPROM chip ready for installation on the HardFrame circuit board. A new graphical interface is found on the improved RDPprep utility. Upgrades are available for \$49.00 plus \$2.00 ship-

ping and handling (\$12.00 shipping outside North America). Mark the outside of your envelope Attn: HardFrame Driver 1.9. *MicroBotics, Inc., 1251 American Parkway, Richardson, TX 75081, (214) 437-5330. Inquiry #202*

QUARTERBACK TOOLS from Central Coast Software is now shipping. This program provides several disk optimizing and troubleshooting utilities. Owners of version 1.0 have been asked to contact Central Coast Software via a special bulletin board number so that they may download the latest version of the software, version 1.2A. You may use any modem speed up to 19.2 Kilobaud when connecting. When you connect, leave a message for the sysop requesting a tools conference. In your message, be sure to mention your serial number. If the sysop is available, he will authorize the download immediately; otherwise, he will authorize your download as soon as he becomes available. If you don't have a modem available, call Central Coast Software on their voice line, and they will provide details on how you can upgrade your version 1.0 Quarterback Tools. According to Betty Chamberlain of Central Coast, version 1.2A is solid. The only known problem is that BlitzDisk, a utility available from another manufacturer, must be shut off for Quarterback Tools to operate properly. *Central Coast Software, 424 Vista Avenue, Golden, CO 80401, (303) 526-1030 (voice line), (316) 686-0870 (BBS number for upgrade). Inquiry #203*

APPLIED ENGINEERING has announced an upgrade to the driver software for the AEHD (high density) Amiga drive. The upgrade addresses compatibility problems associated with CrossDOS version 4.0, and now allows Quarterback version 4.2 or later to automatically eject a high density disk when it's filled to its 1.52MB limit. There is also a program included on the upgrade disk called EjectKey that provides the user with a hot key sequence that allows disk ejection from the keyboard. The driver is currently being shipped with all AEHD drives, and is also Workbench 2.0-compatible. Applied Engineering's upgrade policy on this utility is for you to contact the local dealer where you purchased the drive. The upgrade is available at no charge (except possibly for media, depending upon your dealer.) If you wish, you may order the driver directly from Applied Engineering;

however, they have a standard \$15.00 upgrade handling fee which must be included with your order. *Applied Engineering, Box 5100, Carrollton, TX 75011, (214) 241-6060. Inquiry #204*

TTR DEVELOPMENT has upgraded its Workbench utility, the Workbench Management System (formerly the Time Waste Management System), to version 2.0. WMS is a utility that presents buttons on the Workbench screen that perform several different functions. Built-in functions include a memo pad, phone book and appointment calendar, among many others. The program can also show pictures, read text, and execute your most-often-used program files at the click of a mouse button. Version 2.0 has many enhanced features, and is now completely user-configurable. You can set up several panels that contain buttons to call up your favorite software. The program is now also compatible with Workbench 2.0. The program upgrade is being shipped to registered users who request it for only \$10.00 (to cover the cost of the new manual and shipping). To obtain your upgrade, send to TTR Development your original disk and your registration card (if you didn't already send it) with a return address and the \$10.00 upgrade fee. *TTR Development, 1120 Gammon LN, Madison, WI 53719, (608) 277-8071. Inquiry #205*

THE RIGHT ANSWERS GROUP has announced an improved version of The Director, its presentation development language [see *Animation Chart*, pp. 55-58, for features listing]. According to a press release, the upgrade includes several new features and modules. The program now comes with a full-featured script editor, automatic buffer handling, and complete Workbench operation. There is also a new sound module, and the SMUS, IFF, and FileReq modules have been improved. Users of The Director Version 1 can upgrade to the latest version for \$60.00, plus \$10.00 shipping and handling. *The Right Answers Group, Box 3699, Torrance, CA 90510, (213) 325-1311. Inquiry #206*

•AC•

If you have any workarounds or bugs to report, or if you know of any upgrades to commercial software, you may write to John Steiner, c/o Amazing Computing, P.O. Box 869, Fall River, MA 02720-0869

...or leave EMail to Publisher on People Link or 73075,1735 on CompuServe.

“M - I - C ...”

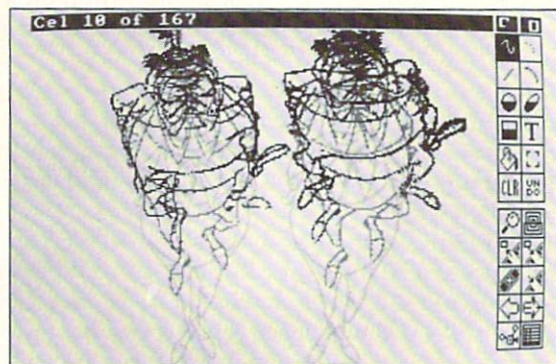
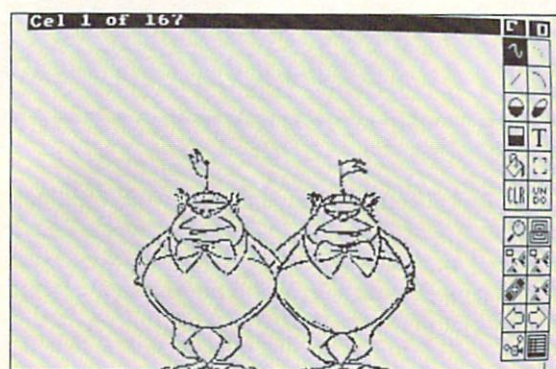
See how easy it is to create character animations!

“K - E - Y ...”

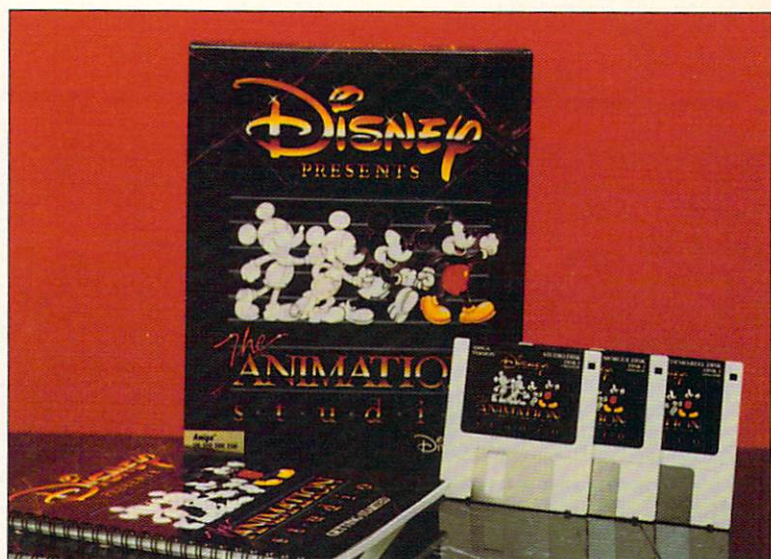
Why? Because it's

Disney!

“ONION SKIN” TECHNOLOGY AND
THE TRADITION THAT IS DISNEY MAKE
THE ANIMATION STUDIO A CLASSIC
CHARACTER ANIMATION PROGRAM.



top: Tweedle-dee and Tweedle-dum “squash and stretch” in one of several included Disney animations.
bottom: “Onion skin” feature displays up to four frames simultaneously for more fluid animations.



Disney and its new software division have certainly made a splash in the Amiga community with The Animation Studio, a package that takes a traditional approach to this fascinating art form. Traditional in the sense that—unlike most Amiga animation programs filled with special effects—this flexible program provides you with your own pencil/pen & ink studio for creating cartoon animations. There are even options to add sound effects and music!

The package includes a separate “Getting Started” manual perfect for those who want to dive right in and get results fast. The “User’s Guide” is much more detailed and even provides a short history of animation and the Disney approach to it. Presented are explanations about creating rough drafts of your characters and the need to constantly refine them; the manual stresses the importance of creating personality in characters through development of certain physical characteristics.

The storyboard is described as a road map that guides the animation artists from scene to scene. Background art layouts and the importance of character emotions and expressions are also touched upon. There is even a brief look at the role computers

have had in aiding Disney artists during the creation of some of their memorable feature films.

The two main parts of the program itself are Pencil Test and the Ink & Paint workshop. The two can run as one program, or can be run separately for 512K users.

Most projects begin on the Pencil Test screen. The DeluxePaint-style interface is easy to get around in, with lots of keyboard equivalent commands. Basic drawing commands—such as freehand line, dotted line, line, curve, circle, ellipse, rectangle, text (with Amiga font support), pick-up brush, clear, undo, magnify, and zoom—are all here. There are also gadgets that let you copy brushes to and from a buffer, delete and insert cels, move forward and backward through the cels, and play your animation.

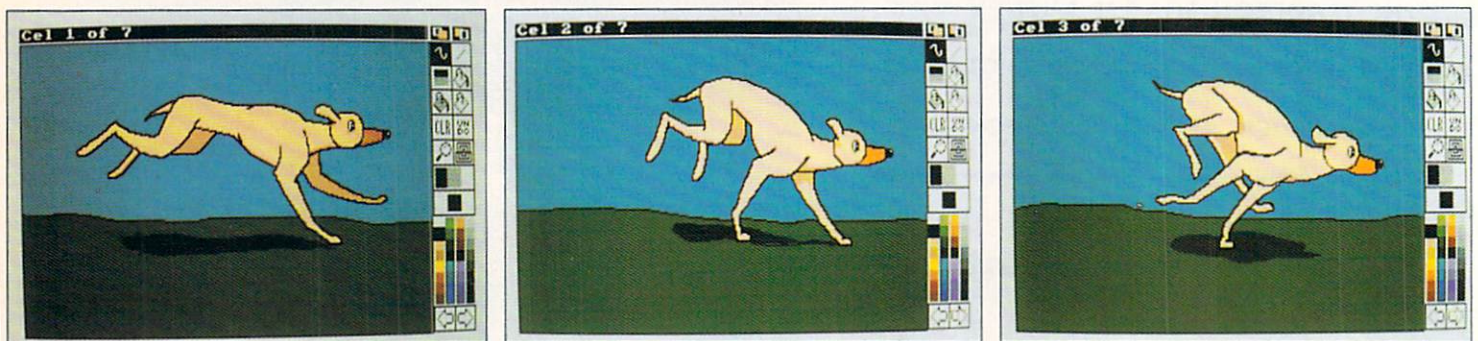
The Disney tradition is perhaps most evident in The Animation Studio's "onion skin" technology.

HAM) with user-definable cel sizes, including standard and severe overscan.

Once you have created your black-and-white "pencil" animation, you move into a section of the program called the "Exposure Sheet". This is the "master mind" part of the program, where you enter commands to control the timing of the animation and cel order, as well as the cueing of music and sound effects to come in at exact places.

Plenty of sound effects are included and there is also support for .INSTR sound files, as well as SMUS and SONIX song files. Speaking of support, the ANIM file format and IFF format are also fully compatible with The Animation Studio, permitting file interchange with dozens of Amiga programs.

The Exposure Sheet is the least glamorous part of the program, but also the most important. It is basically a text script template that triggers various events in your animation, like



Here, an included tutorial animation ("Four-Legged Run") has been cleaned up and colorized in Ink & Paint.

After you draw one frame and click ahead to draw the next, the onion skin effect lets you see the first frame "ghosted" in light grey. This allows perfect accuracy when drawing changes from frame to frame. You can see up to four frames at once, in fact, and can even adjust the colors and intensities of the ghosted frames.

This technology mirrors in the Amiga the method that Disney animators use when creating cartoons. Translucent pieces of paper are drawn on and flipped back and forth by the artist to make sure the movement is smooth and follows the intended direction from one frame to the next. The Disney animators draw the key frames and poses in the various scenes, and then pass them on to the "in-betweeners", who fill in all the action in between. The "onion-skin" technique is what sets this program apart from most other character animation programs. Being able to see one or more previous frames is essential to creating smooth, fluid character movements and motions.

Fade-in commands allow you to adjust how transparent (or how dark) your ghosted cells are. Other commands include a clean-up feature to remove stray pixels (good for digitized pics), coordinates, copy/paste, resize brush, rotate brush, halve brush, double brush, wider brush, taller brush, any-size brush, and flip brush horizontal/vertical. Frame rate control is excellent, allowing you to set any frame rate and enforce it so an animation will run at a uniform speed. All resolutions are available (except

music and sound effects. You can time the events right down to a specific frame; in fact, each line in the script represents a frame.

Suppose you want a song to start when a certain character makes his/her appearance halfway through the animation. Go to the line representing your chosen "start" frame—say, frame number 100—and type in a command such as: !SCORE <"score.smus"> ["instrdir"] [FADE frames] [TEMPO speed].

The first command (SCORE!) lets the program know it has to play a song starting at this frame. The score is loaded in beforehand so it can "hit" on the exact frame.

Next comes the actual filename of the song, with a .smus extension (.smus is a popular music format used in many music programs, most notably Sonix). Deluxe Music Construction Set also has an option on its menu to save a song (traditionally IFF format in that program) as a .smus-format song.

The program I use the most for music work is Bars&Pipes. The Blue Ribbon SoundWorks recently released a "Multi-Media Kit" add-on disk for this program which includes an accessory call "SMoose". "SMoose" can convert Bars&Pipes-format or MIDI-format songs into .smus songs and save them to disk. This combination makes for an ideal method of creating new songs for your animations, or for converting existing songs to be used with The Animation Studio.

Next, the "instrdir" directs the program where to look for your instrument files. "Fade" lets you fade up your song from 0 (silence) to 255 (loudest). The frame amount follows "Fade" to determine the length of the fade.

"Tempo", as you might expect, controls the beats per minute, and is more important to a finished animation than you might expect. Many songs run too long to be included in an animation as is; but, by altering the tempo, you are able to match the length of the song to the length of the presentation.

There is a "!Volume" command which lets you control the volume of a score, sound effect, or instrument. Basic level instrument mixing is possible with this command: keep the trumpets out in front (loudest), with a back-beat, well ... in the back!

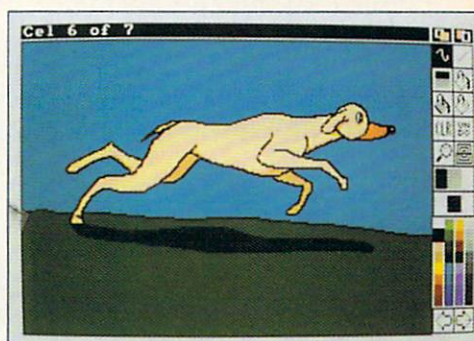
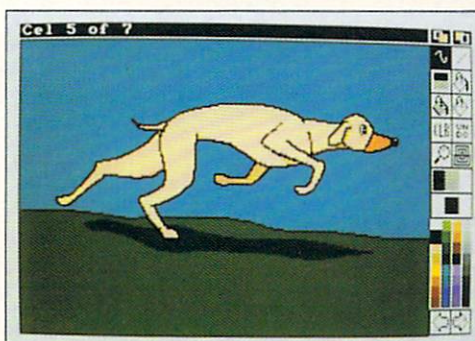
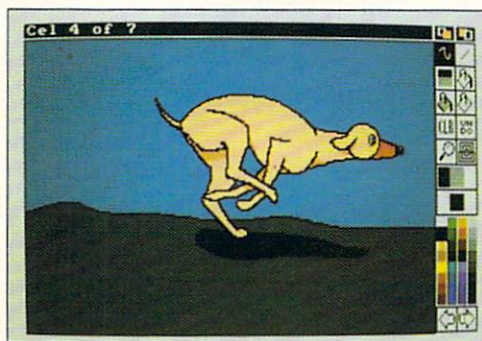
The "fade" command comes into play here as well, since you can indicate the number of frames over which a volume increase or decrease will occur. You can also use the "channel"

off. There is also a "Stop" command to stop a current score, sound effect or note.

There are numerous commands to edit your exposure sheet, such as copy, cut, paste, and search. "Sparse" is a command that can be added into your sheet to represent blank frames. This is included to facilitate the slowing down of parts of the animation. A "Print" option sends the current exposure sheet file to a printer.

One of the best features of the exposure sheet screen is the "Preview" menu. Here you can preview any score, instrument, or sound effect before including it in your presentation. Pitch and volume control is added for altering instruments and sound effects. After all your commands for frame order, music, and sound are typed in, the sheet is then saved to disk.

Next, it's time to move into the Ink & Paint section of the program. Basically, this section is the same as Pencil Test, with



command to output to the left speaker, the right speaker, or both.

"!SFX" stands for "sound effects", and this command may look something like this: !SFX ["sfx.instr"] [SPEED rate] [LOOP times] [CHANNEL <num/STEREO/ALL>].

The first bracket holds the file name of the sound effect along with a path, if the sound effect is not in the current directory, or not in the directory that the animation loaded from.

The "Speed" rate sets the Amiga cycle rate. A lower number gives a higher pitched sound effect and a higher replay rate. "Loop" controls how many times the effect will repeat. The program comes with a wealth of "bangs" and "zooms", but by altering the pitch with various loop lengths, you can create some of your own "classics" on the fly. Once again, the "Channel" can be set to provide sound through certain speakers only, or in stereo.

One of the more interesting commands of the Exposure Sheet is the "Note" command: !NOTE ["note.instr"] [KEY value] [OCTAVE n] [CHANNEL <num/STEREO/ALL>] [RELEASE].

This allows you to "play" a note of a certain instrument. The "Key" command sets the "value" of the note from C, C#, D, D#, E, E, F, F#, G, G, G#, A, A, A#, B, B and the "Octave" command sets the octave of the selected instrument. If you don't want to play one note in stereo, there is an option to play two notes simultaneously. "Release" tells the program when to cut the note

added features like color control. Dithering allows you to create different variations of the existing 32 colors to produce a more varied palette. Color backgrounds can be loaded in "underneath" your animation through the Frisket requester. Complete color control includes all the standards such as copy, exchange, spread, range, cycle, cycle direction, remap, and RGB-HSV sliders. You can also select the amount of colors used—2, 4, 8, 16, or 32.

Once your completed masterpiece is ready for an audience, you can put it on videotape using the "NTSC Filter" (genlock or encoder hardware required). This filter actually blocks out the illegal colors used by the Amiga (illegal colors are those outside the range of NTSC broadcast; they look excellent on an RGB monitor, but bleed and shift once transferred to composite video). Turning the filter on is done from the "Preferences" menu.

Disney's Animation Studio has a lot of strong points and only a very few drawbacks.

It is designed as an animator's tool, and that's exactly what it is. It doesn't create character animations out of thin air—that's up to the artist. If you are a cartoonist this program is perfect.

If you shy away from drawing on a computer screen, you can easily digitize your sketches with a digitizer and bring them into the program to color and control. Even if you don't have a talent for drawing characters, there's a lot of fun to be had with the

(continued on page 45)

Forensic Animation

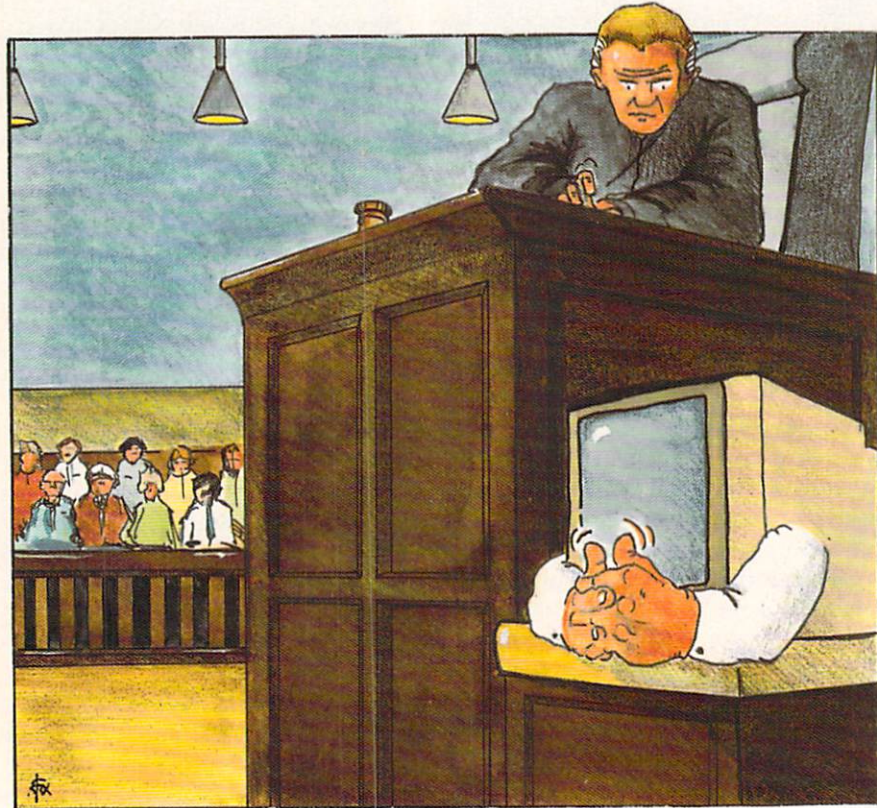
by Andrew Lichtman

WITHOUT IMMEDIATE ACTION BY ONE OF THE DRIVERS, two cars approaching an intersection—one white, one red—will collide. The driver of the white car swerves quickly to the right while braking and, losing control of the car, runs off the road onto the sidewalk on the other side of the street. By the time the white car has come to rest, the red car has already exited the intersection, with no apparent change in speed.

This is the all-too-familiar story of a traffic accident which could end up being litigated before a jury in one of our courts. In most such suits, jury members are expected to use the evidence presented to reconstruct the accident in their imaginations, there (of course) being no film or videotape of the scene of the accident at the time it occurred.

But in this particular case, the jury might be in for a treat. Using Amiga computers, an animator associated with the Martinez, California firm of Creative Concepts generated a reconstruction of the accident which the members of the jury could view almost as if they were bystanders at the intersection at the moment of the accident.

To the courts, however, the word "almost" may be the crux of whether the jury will be permitted to see the animation at all. You don't have to be a lawyer to know that there are rules of evidence; the litigants can't just show the jury whatever they want. In other words, the value of forensic animations—and the business of supplying them to lawyers—will rise or fall according to what the courts decide about the admissibility of this new kind of "demonstrative evidence" in the years ahead.



As a California lawyer, I am qualified to give my opinion on the case law interpreting the rules of evidence in that state: there are no California appellate court decisions yet specifically deciding the admissibility of animations (decisions below the appellate level cannot be cited as California authority). Apparently, the situation has not progressed much further nationwide.

On the day I finalized this article for publication I accessed the Lexis database with my office Amiga to do a search for appellate opinions by any state or federal court since 1983 in which the words "evidence" and "animation" were within 25 words of each other (the first use of animations by lawyers is thought to have been no earlier than 1983).

My computer search found four such opinions, only one of which—by a Louisiana Court of Appeal in 1990—was on the right subject; an animation had been put into evidence by a defendant in an automobile accident. The opinion noted this with approval, but it did not really focus on any attendant evidentiary issues.

Based on my informal survey all the other news appearing so far in the legal and computer literature nationally is also favorable. Although the appellate cases don't reflect it yet, computer reconstructions are increasingly being used to try cases and obtain settlements.

This favorable report is not a product of enthusiasm for the Amiga. That obviously was not the computer used in the pioneering animation of 1983, and as recently as February, 1990, the monthly publication of California's

DEMONSTRATIVE EVIDENCE IN CALIFORNIA

In the absence of any cases directly "on point", a lawyer trying to predict the courts' treatment of computer reconstructions would next turn to other legal precedents interpreting the rules of evidence; namely, cases discussing the admissibility of similar kinds of demonstrative evidence. In California, for instance, there are numerous such cases involving the recording of a reenactment or reconstruction of a disputed event. The evidentiary issue is whether the recording should be viewed by the jury.

Examples from such case law are: a photograph designed to show lighting conditions at the scene of a crime; films of train crossings with either a different train approaching it than the one involved in the dispute, or with the same train but at a different time of day; and a film of an experiment in which lighted matches were thrown from a moving jeep to show that they remained lighted.

In such cases, a necessary (but not sufficient) condition for the admissibility of the photo, video, or film is a "foundational" showing that the portrayed facts and conditions accurately depict what actually occurred. While the need for this requirement is understandable, it is not always easy to predict how the courts will interpret it.

All such recordings are by their nature only approximations of what they reconstruct. There is always a risk that, on the opposing party's objection, a court might find the approximation insufficient enough to bar admission of the recording into evidence. Even if the court hearing the trial admits such a recording, the losing party gets another shot at throwing the evidence out on appeal.

Among the cases described above, the appellate court disagreed with the trial court's admission of the evidence in the first case (the photos were taken many months later than the crime and were not taken at the same hour of the morning) and in one of the train cases (the train filmed was orange, while the actual train was black). In the other train case and in the jeep case, the trial court's admission of the evidence

survived appeal, even though the small courtroom distorted the sound of the train, the train accident occurred at night (while the film was shot during the day), and the wind and temperature conditions for the jeep experiment were not identical to those at the time of the actual event.

As indicated previously, that a film, photo, or video passes the foundational test is not sufficient to assure its admissibility in California. The other test most commonly flunked by such exhibits is that they must not be unduly "prejudicial". This is taken to mean anything which might inflame the jury unnecessarily. So, a photograph showing the front view of a deceased was held to have been improperly admitted because its prejudicial effect outweighed its probative value. On the other hand, in another case gruesome color photos were allowed because of their great evidentiary value.

It is the job of attorneys to find a way to reconcile the results of such cases, but to anybody else with a passing exposure to the courts, the suspicion must be that all of the legal mumbo jumbo boils down to their inherent unpredictability.

I, too, consider our present legal system to be flawed, and my five years of experience with the Amiga computer have convinced me that one day we will find a way to replace the courts with something no less complex, perhaps, but more akin to what computer programmers face: the kind of complexity which nonetheless reliably delivers the intended results for the person committed enough to learn the system.

In the meantime, the legal profession clings to the fiction that court opinions (anecdotes, really) can be studied to reveal the thread of a "rule". This creates the free-for-all where each counsel argues for the existence of the rule that favors his or her client.

You might consider that I am doing no differently when I propose that the objections to demonstrative evidence upheld by California courts do not appear to threaten the admission of properly done animations. —A.L.

State Bar did not mention the Amiga anywhere in its article called "Roger Rabbit Goes to Court".

It is testimony to the ground swell of interest in forensic animation that so much has already been accomplished *without* the Amiga. Other brands of personal computers have traditionally been chosen by law firms, even for graphics applications. No doubt due to the limitations of such computers, it seems to be the high-end equipment which has gotten all the legal press regarding animations.

For instance, an article in the California Law Business section of the April 25, 1988, *Los Angeles Daily Journal*, described three graphics arts firms doing forensic animation using proprietary software on systems such as a BOSCH FGS-4000 Computer Editing System or an Ethernet network of two UNIX-based minicomputers,

a Silicon Graphics Series 3000, and a Sun 3/160.

The failure to employ Amigas may have been out of ignorance. To my knowledge, only within the past year has news of courtroom use of Amigas appeared in national publications, and that solely within the Amiga community.

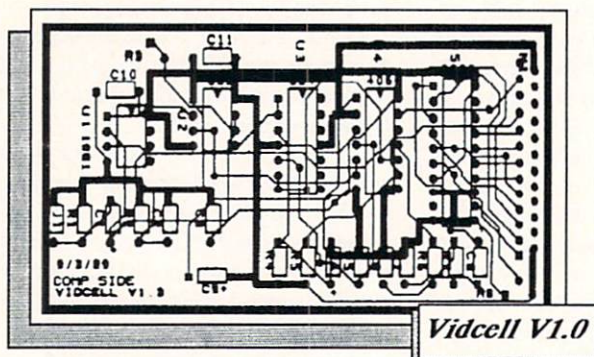
So, with no definitive legal precedent on admissibility as evidence and with the Amiga practically a trade secret, what has fueled the forensic animation business? There are at least four answers, all of which together indicate an imminent explosion of growth in this area of legal practice.

First, of course, are all the advantages computers offer over the alternative of labor-intensive and artistically specialized animation techniques. A main advantage is price. Attorneys could not consider using animation at Walt Disney's rates. Unlike some areas of the economy (including

the legal profession itself), market forces are working, assuring that the less computer reconstructions cost, the more attorneys will recommend them to their clients.

The underlying reason for these economies represents another advantage: with 3-D animation, not only can the total project be done reasonably quickly by persons having relatively little artistic talent, but also the bulk of the human work is done only once at the start, to set up all the data files. After that part of the project, the generation of computer visuals from any perspective within that 3-D scene can be very fast, offering more choices, allowing more changes, and even that litigator's bane, facilitating the overnight revision.

The industrial-grade animations you see accompanying this article enhances these advantages more than if the animator had created the more refined product of which the Amiga is capable. To the



KIT INCLUDES

- CIRCUIT BOARD
- ALL PARTS MINUS CASE
- SOFTWARE ON 3.5" DISK
- RE-PRINT OF ORIGINAL ARTICLE

Please Send Check or Money Order for \$79.95

TO: **GT Devices**

P.O. BOX 2098

Pasco, Wa. 99301

**FREE
SHIPPING**

GT Devices

PRESENTS

Vidcell

VIDEO DIGITIZER KIT 256 GRAY SCALE

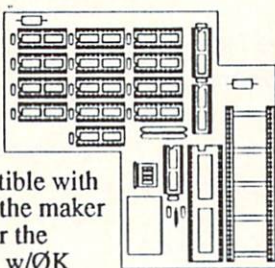
FEATURES:

- INTUITION/CONTROL PANEL INTERFACE
- SOURCE CODE (ASSEMBLY)
- SCHEMATIC/THEORY OF OPERATION
- 640 X 400 RESOLUTION
- ACCEPTS STANDARD VIDEO SIGNAL

Circle 116 on Reader Service card.

Insider II 1.5 Meg in the A1000

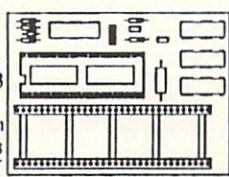
Allows A1000 owners to add up to 1.5 Meg of Fast Ram internally. User expandable in 512K increments. Includes battery backed clock/calendar. Simple installation, no soldering required. The Insider II is compatible with the KwikStart Rom board. From the maker of the first internal Ram board for the A1000. Retail Price \$249.95 w/ØK



KwikStart A1000 V1.3 or V2.0

Allows A1000 owners to install V1.3 or V2.0 Kickstart in Rom. Frees up 256K of memory to use as Fast Ram under V1.3. Upgrade to the latest operating system and still be able to use Kickstart from disk if needed.

Retail Price \$99.95 w/o Roms



MultiStart II A500 & A2000

Allows A500 and A2000 owners to install Kickstart V1.3 and V2.0 Roms and switch between them with the keyboard. Can also install a third Rom. Lets you stay compatible with your software. No external wires or switches required.

Retail Price \$99.95 w/o Roms



All Products come with a
Full One Year Warranty.

Contact your local dealer or call for more information.

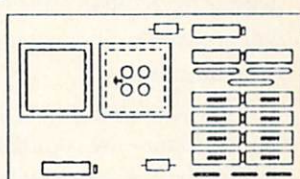
DKB Software

832 First St. Milford, MI 48381
(313) 685-2383

Circle 159 on Reader Service card.

MegAChip 2000 2 Meg of Chip Ram for the A2000

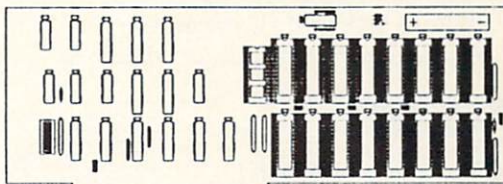
If you use your Amiga for Graphics, Desktop Publishing, Desktop Video, 3D Rendering & Animation, or Multimedia - Then you need the MegAChip 2000. Doubles the amount of memory accessible to the custom chips. Allows you to have a total of 10 Meg of Ram. Fully compatible with System 2.0 and the ECS Denise chip.



Retail Price \$299.95 w/Memory
w/o 2Meg Agnus

The BattDisk Battery Backed Static RamDisk

Super fast Static Ram Disk for the A2000 & A3000. Allows you to have up to a 2 Meg RamDisk and still have 2 Meg of Chip Ram and 8 Meg of Fast Ram. Easily expandable in 64K or 256K increments to 2 Meg. Excellent if you are working with Multimedia applications or animations where you need fast access to files. Can be used to boot your system, fully autobootable under 1.3 to FFS. Also can be hardware or software write protected. Programmers - Keep your source code in fast guru safe static ram.



Retail Price \$269.95 w/ØK

(Disney, continued from page 41)

"onion skin" effect alone. It's amazing how easy it is to animate objects when you can "see" where they're heading.

Tools are available in gadget form via the keyboard and pull-down menus. This is the kind of "overkill" that's welcome in any Amiga product.

One drawback here is the lack of built-in brushes to select; however, you can pick up anything and draw with it. The paint dithering (used often in IBM paint programs to create artificial hues) is another welcome addition and expands the palette.

The Exposure Sheet presents a problem of the double-edged sword variety. While there is no doubt that it is powerful and flexible, the method of typing in commands on lines makes the CLI look like a piece of cake! It seems wildly out of place in a program that is so easy, automatic, and graceful in all other areas.

Of course, some users won't even use Exposure Sheet if all they want to do is create animations, but it is certainly tedious to work with if you have an involved project in mind. Hopefully, a future update will simplify and "mouse-ize" (pun intended) this part of the program, with perhaps an "AmigaVision"-style file/command selection.

A Donald Duck demo and other included reference Disney animations hit their intended mark in providing inspiration, and look mighty impressive leaping around an Amiga screen.

The program is copy protected through the manual look-up word technique, and easily installs on a hard drive. Overall, this is a first-class program which gets the user up and running fast, creating animations with easy-to-use techniques.

Even with all these tools and extras, the most important feature of this program is not on the menu—it's in the manual. I've yet to see an animation program actually *teach* animation—until now. Rough sketch, movement, extremes, silhouette, arcing, squash, stretch, path of action, flying, walk, run, anticipation—it's about time someone sat Amiga users down and taught them the basics of classic animation.

We should have known it would be Disney.

The Animation Studio

Price: \$179.95

Walt Disney Computer Software, Inc.

500 S. Buena Vista Street

Burbank, CA 91521

(818) 567-5360

Inquiry #207

•AC•

extent the sophistication of an animation will impede the ease of revision or even make it too expensive to undertake animating in the first place, most lawsuits will not warrant ray tracing, much less a Pixar machine.

The third reason for the invasion of the courthouse by computer reconstructions is the jury's reception of them. It is not just the utter despair of jurors trapped in court all day, bored by lawyers and by the snail's pace of the proceedings; the typical juror's cultural background has trained him or her to focus on and absorb whatever is displayed in video. From the literature and my own personal experience, I gather there is a significant increase in both the communication and the retention of information through the video medium. Judges themselves may not be immune to some of these same considerations.

Fourth, computer reconstructions are becoming popular because auto accidents are hardly the limit of where they can help lawyers. Animations have been used in cases involving such diverse facts as an airplane crash, the massive hexane explosion disaster in Louisville, Kentucky, default on construction schedules for a building project, the method of operation of patented devices, the fire destroying nearly an entire downtown block of Minneapolis, and the biology of bodily injuries or diseases.

Like its cousin, computer-generated graphics, animation could also aid in case preparation by improving a witness' communication about what happened, or giving investigators ideas about where to look for additional evidence.

As more lawyers learn about the availability of animation, they will come up with novel uses for it. After Westminster, California attorney John Cogorno viewed the Creative Concept animation, he considered using an animation in a police-shooting case where many weapons were fired at his client from different locations in the space of only a few seconds. To make the computer reconstruction of the tragedy more intelligible, he would need to make it depart somewhat from exact realism, such as by using lines to show the paths of the bullets.

The animation in the Louisiana case mentioned earlier in this article also involved a departure from a strict reconstruction. A bridge entrance which actually had no guardrails was depicted with them to show "what might have happened" had they been in place.

Software Titles

3D Professional
688 Attack Sub
A-Talk III
A.M.O.S.
A10 Thank Killer
Ac-Basic
Adventure
All Dogs Go To Heaven
Amaz II
Ami... Alignment System
Amiga Vision
Animagic
Animation Station
Arcade Smash Hits
Audio Master III
Aunt Arctic Adventure
Auto Prompt
AutoScript
Bandit Of Ancient China
Bars & Pipes
Batman
Battle Hawks 1942
Battle Of Britain
Battletch
BenchMark Modula II
Beyond Dark Castle
Black Gold
Blue Angels
BlueCast Tattler 2.0
Buck Rogers
Cadaver
Caligari
Can De
Cape 68K
Carthage
Chaos Strikes Back
Check Mate
Clown-O-Mania
Clue Master Detective
Code Name Ice Man
Colonel's Request
Conquest Of Camelot
Cribbage Gin King

Heavy Metal
Hero's Quest
Highway Patrol II
Hockey League Simulator
Hoyles Book Of Games
Hunt For Red October
Image Link
Imagine 1.0
Imperium
Indiana Jones
Indianapolis 500
Intelligence
It Came From Desert
It Came From Space
Jack Nicklaus Golf Unlim.
Karafonts
Killing Game Show
King's Quest
Land, Sea and Air
Lattice C++
Legend of Faerghall
Lethal Weapon I-II-III
Loom
Lords Of The Rising Sun
M1 Tank Platoon
Mac 2 Dos
Mancian Mansion
Master Piece Fonts
Math Vision 2.0
Micro Filler
Midwinter
Modeler 3D
Music X
Night Breed
Nitro
Nobunaga's Ambition
On Line
Page Render 3D
Page Stream 2.1
Pen Pal
Phasar 4.0
Pirates
Pixel 3D
Police Quest 1 & 2
Pool of Radiance

Populous
Populous Promised Lands
Pro Video Post
Professional Draw 2.0
Professional Page 2.0
ProWrite 3.0
Puffy's Saga
QuarterBack
QuarterBack Tools 1.3
Rick Dangerous 1 & II
Risk
Romance Of Three Kingdoms
Saxxon Publisher
Scrabble
Shadow Of The Beast I & II
Sherman M4
Show Maker
Sim City
Sky Line BBS
Solitaire Royal
Sonix
Space Ace
Space Quest 1, 2 & 3
Speedball
Spiderman
Starlight
Strike Ace
Stunt Track Racer
SuperBase Professional
Targhan
Tennis Cup
Test Drive II
Tetris
TFMK
The Art Department
The Art Department Pro
The Immortal
The Intouchables
Thinker
Tiger Cub
Turrican
TV Show Professional
TV Sports Basketball
TV Sports Football
TV Text Professional
Ultima V

Unreal
Vista Professional
Wayne Gretzky Hockey
Welltris
Where In Europe
Where In The USA
Where In The World
Where In Time
Wings
World Class Leader Board
X-Cad 3D
Zuma Fonts

HardWare

HD DISK CONTROLLERS
GVF Series II 2000.500
Commodore 2091
Hard Frame (microBotics)
Comspec
ICD A2000 controllers
and more...

HD DISKS
40Mb to 210Mb Quantum Scsi HD
45Mb to 210Mb Rodime Scsi HD
44Mb Removable Scsi HD
and more...

RAM BOARDS & CHIPS
CBM A2058 0K/8Mb
Supra Ram 0K/8Mb
Micro Botics 0K/8Mb
Exp-8000 2Mb/8Mb A500
Commodore A501
Supra Ram A500 (512K)
Ram Chip all models (Call)

GENLOCKS
Omni-Gen
Magni Genlock
Super Gen
Super Gen A2000 S-VHS
Mini Gen
and more...

SCANNER & DIGITIZERS
Sharp JX-100 JX-300 JX-450
Migraph Hand Scanner
Frame grabber
Hp-scanjet plus
digi-view 4.0

VIDEO HARDWARE
• NEWTEK VIDEO TOASTER
IDEN time base corr. II
DC-TV
FlickerFixer
Commodore A2320 Video Adapter

EXTRAS
AmigaNet NetWork Card 500.2000
Jim mouse
Gravis joysticks
Supra Modem 2400Baud Ext. & Int
A3000 3.5" 880K Int. Drives
Mouse Master
Panasonic WV1410 Camera
and much much more...

CHECK OUR MONTHLY SPECIALS

NEWTEK VIDEO TOASTER



NOW ON DEMO!!!

CANADA'S LARGEST SELECTION OF AMIGA SOFTWARE

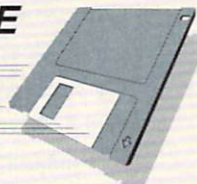
WE ARE:

- Commodore Authorized Dealer
- Commodore Authorized Service Center
- Commodore Authorized Educational Dealer
- Commodore Corporate and Business Center
- Dedicated to Amiga computers and after sale service.

WE OFFER:

- All Amiga sold by us will be serviced within 72 hrs in shop.
- Warranty extension plans and service contracts are also available.
- We offer on site financing and leasing
- We also provide on site service (part of service contract) and offer replacement units.
- We offer on site training. In '91 we will have a dedicated classroom for training (15 to 25 people).
- We will also have our own editing suite with VTRs, TBCs, and the famous NEWTEK TOASTER for presentation purposes.

MAISON DU LOGICIEL SOFTWAREWAREHOUSE



2466 Jean-Talon East, Montréal, Québec H2E 1W2

IN STORE SERVICES:

Postscript Laser Output
Color Printing (HP Paintjet)
Color Slides (35mm or Polaroid)
Color Scanning 300Dpi (Sharp JX-300)
Digitizing (Digi-View)
Equipment rental
We rent genlocks, framegrabbers, etc...
And more...

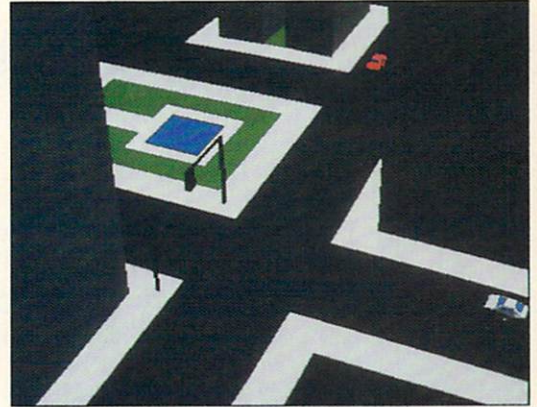
CALL NOW
(514) 374-3614



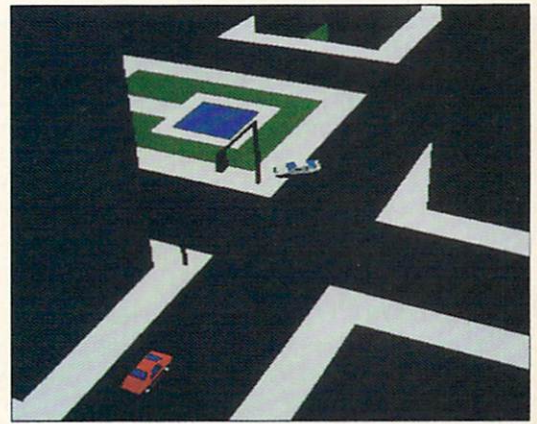
White car approaches intersection.



Red car approaches intersection without any reduction in speed for the red light.



The two cars are approaching the intersection.



White car swerves to the right; control of the car is lost. Red car continues on without any change in speed.

The examples discussed here do not begin to exhaust what is amenable to effective computer reconstruction.

I further believe the lack of realism in animations paradoxically promotes their acceptance by the courts. While I cannot adequately defend my opinion without discussing legal matters beyond the scope of this magazine, the general point is that evidentiary problems often stem from the purported realism of "demonstrative evidence". When inaccurate, that (false) realism is not welcome in the courts, naturally. You may be surprised to learn, however, that even true-to-life depictions can be deemed too vivid to be viewed by the jury.

In contrast, there seems to be less worry with animations because they purport to show so much less. Of course, there

must be something of significance accurately portrayed by the animation for the court to permit the jury to view it. The beauty is how the animator might handle all of the other aspects of the scene. Since they are obviously characterizations, nobody is going to be misled or inflamed by the fact that the cars don't look real or the background has none of the detail of the actual accident site.

Photorealism, desirable as it may be for technical or artistic purposes, risks coming across in a trial as irrelevant or, worse, as sensationalism. As the successful forensic medical illustrator Greg Swayne has acknowledged, it is best to show the subject with a "clinical" style, and "If the drama comes through after that, fine."

Therefore, when the goal is to minimize the risk of rejection by the court, once again the industrial grade of animation is the way to go.

Given these reasons for this revolution in the way cases are being litigated, the potential role of the Amiga speaks for itself. 3-D animation technology on the Amiga is inexpensive and easy enough to use for computer reconstructions to be produced by law firms entirely in house.

It may not be long before the well-prepared attorney will not dare go to court without bringing the judge and jury their anticipated animation.

Above screen shots taken from animations produced by Creative Concepts, 28 Alan Way, Martinez, CA 94553, (415) 372-7278.

•AC•

CARTOON ANIMATION

by D. L. Richardson

We are in the midst of an animation revolution. Conventional methods are giving way to those born of computers. The "cel", standard of the industry for half a century, is now an endangered species. This is a course in Amiga animation video. It features professional techniques which can be used by animators of all skill levels.

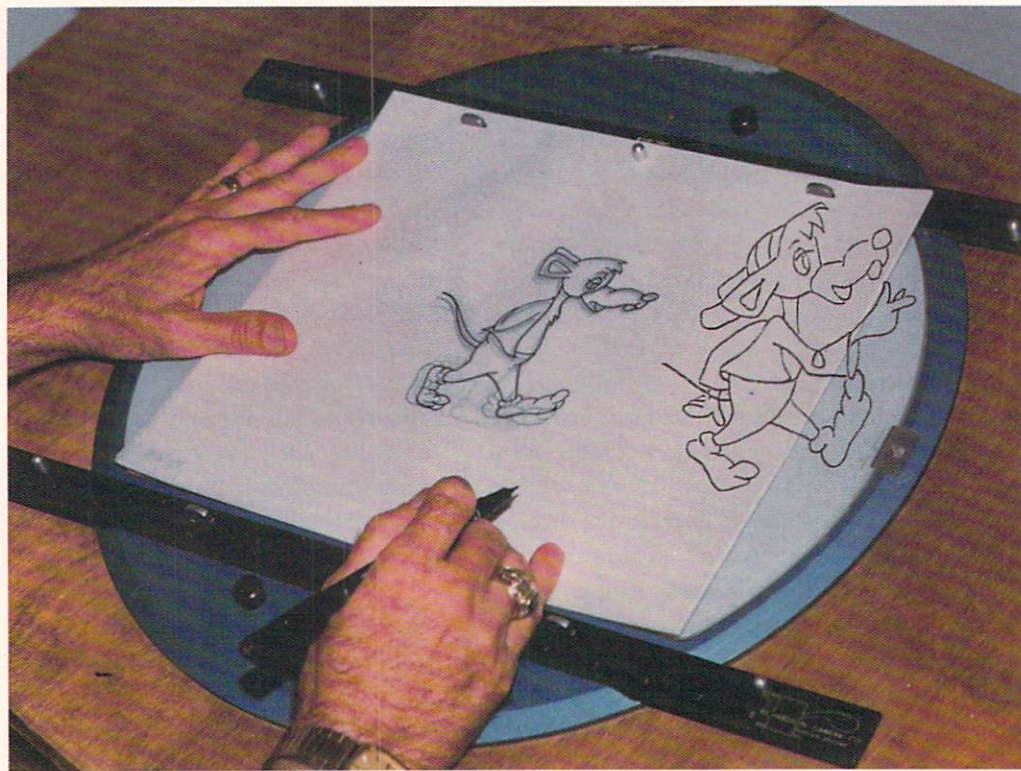
We can't overlook the fact that the fine art of cartoon animation reached a very high level of development before computers entered the picture. It would be a mistake for the new-generation animator to overlook the many lessons learned painstakingly through trial and error over the years.

One of the first American-made animated cartoons was produced in 1909 by Winsor McCay, a New York City newspaper cartoonist. It was about "Gertie", a dinosaur, and required 10,000 individual drawings. Gertie holds up surprisingly well today, after more than 80 years, which attests to the remarkable achievement it really was.

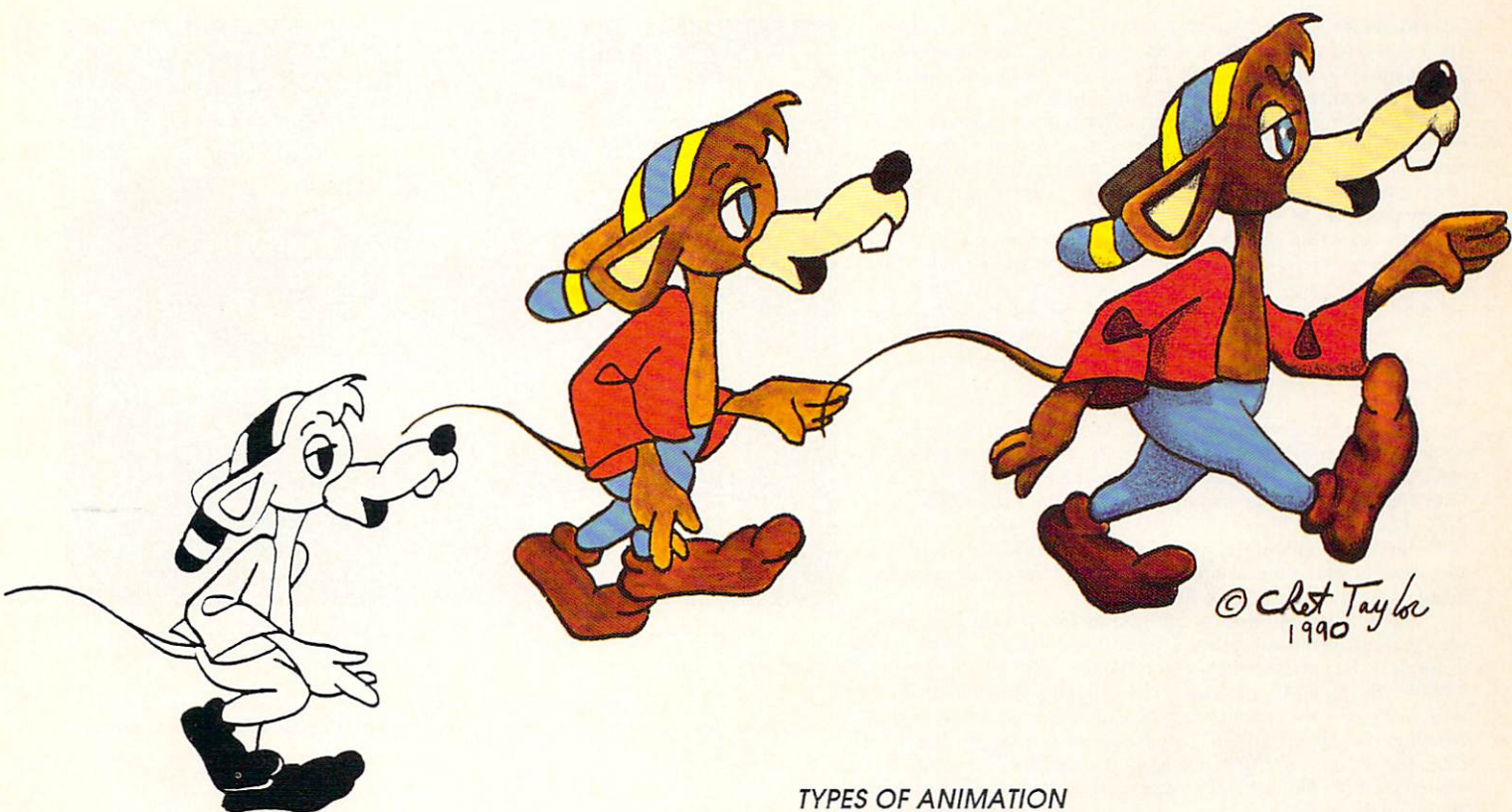
Some of the techniques pioneered in that early project became standards in the industry. Among them, the cycle, in which a series of frames is shown over and over to produce a repeated action.

PART I: FUNDAMENTALS OF MOTION

But before we get too far into techniques, let's start with the very basics. The definition of "animated" is "full of movement; having the appearance of something alive." But in an animated film or video, *nothing* actually moves. The apparent motion is an illusion, created by a series of still, motionless pictures, each one slightly different from the previous one. It is only when the pictures are shown in rapid succession that we perceive the illusory motion.



An animation disc has sliding peg bars at both top and bottom and a light underneath to allow the animator to see through several layers of tracing paper.



The reason we do not see individual still frames blinking on and off is due to the phenomenon of "retention of vision". That is, the lens of the human eye focuses each image onto the retina, which retains an image for about $1/50$ of a second *after* the light from that image is cut off. This brief interval is just long enough for the *next* image to appear. In this way, the human eye sees a series of images presented to it in rapid succession as one continuous picture.

The length of this retention of vision was the determining factor when movies settled on a rate of 24 frames per second (fps). This is still the United States' standard; however, some parts of the world have altered the rate to 25 fps.

Video, on the other hand, standardized on 30 frames per second, but added an unusual twist. Television images actually blink on and off at the rate of 60 times per second, but it takes two blinks to show one full frame. First, the even-numbered scan lines blink on, then the odd-numbered scan lines of the same frame. This results in what we affectionately refer to as the "interlaced" screen.

No doubt you are familiar with the flicker or vibration associated with interlaced images of a computer. All professional video and television pictures are interlaced, but live video pictures don't appear to flicker. Why?

Computer images appear to flicker because their lines have extremely sharp edges and often extremely high contrast between adjoining lines. So, the flicker is exaggerated. Live video scenes do not appear to flicker because their lines and edges are soft by comparison. No lens can resolve a line as sharply as a computer. Even when highly contrasting lines are side by side, the edges in an image produced by a video camera are softened slightly by "bleeding", or "diffused light". Not so with an image produced by a computer.

TYPES OF ANIMATION

Before the computer revolution, the motion picture industry used two main types of animation: cel and tabletop.

Cel, with one "l", is not to be confused with a biological cell or a jail cell. A cel is a transparent sheet of plastic with registration holes punched along the top or bottom. Only the characters or objects that move are painted on cels. Everything that does not move is painted on the background, generally on art board, also with registration holes. This way, the background can be painted in great detail because it is only painted once, then used throughout the scene. The cel or cels are laid over the background, and together they make up the total picture.

Once the technique of cel animation is understood, it's easy to do similar scenes on an Amiga using paint and pageflipping software.

Tabletop animation uses 3-dimensional solid objects, generally so small that an entire scene can be set on a table—thus the name. The scene is photographed one frame at a time, and the objects that are put in motion are moved slightly between frames.

A person who understands tabletop animation can easily make the transition to 3-D solid modeling animation with an Amiga. However, this type of animation takes considerably more time and does not offer the same degree of control as cel type animation. Also, the equipment needed for 3-D animation is quite expensive. It is my experience that cel animation is much more practical in most types of professional video production.

UNDERSTANDING MOTION

Before any type of animation can be done effectively, it is necessary to understand how things move. This can be achieved largely through close observation of the world about us. We can study balls bouncing, flags waving, and even children playing.

One thing we will notice is that when an object moves from point A to point B, it does not suddenly start at full speed and suddenly stop from full speed. If it did, then its movement could be broken down into frames as demonstrated in Illustration I.

Instead, things generally start slowly and build up to full speed. Then they begin slowing down before reaching the end position. In animation terms this is called "slow in" and "slow out", and this type of movement is charted in Illustration II.

In relating to this, think about what happens when a ball is tossed upward: it appears to pause briefly at the peak of its ascent. Actually, it is losing momentum on the way up, and slowing to a stop. It then immediately begins accelerating downward. Gravity is very predictable.

By watching children, cats, or whatever jumping up and down, we can learn the principles of "squash and stretch". Just before jumping upward, a person squashes down somewhat to build up momentum. As he leaves the ground he is fully stretched out. In the air he can take any shape he wants, but just before landing he again stretches out to absorb the impact, then squashes on landing for the same reason. This is demonstrated in Illustration III.

You are very well wondering, "How can a ball—an inanimate object—stretch to anticipate impact?" In reality, of course, it can't. But we're not necessarily dealing with reality, we're giving human characteristics to inanimate objects. That's what animation is all about.

In reality, a hammer strikes a nail on the head, driving it into the wood. In animation, a nail can see the hammer coming and run away and hide. And who could blame it?

Closely related are "wind up and follow through". Anyone who participates in sports understands what these are. The obvious example is the baseball pitcher who "winds up", throws the ball, and "follows through" after releasing the ball. This principal can be used with many cartoon actions to give them character. Before taking off running, a character might "wind up" by leaning in the opposite direction. When coming to a stop, parts of his body or clothes may overshoot, then return to the stopping position. In 'toon terms, this is a "follow through".

The next principle to discuss is "action and reaction". You probably learned in science that every action has a reaction. It's easy to just draw the action and overlook the reaction, but the latter adds considerably to the effectiveness of a scene. For example, as a very fat



Zeke takes a walk. Moving background has been added.

Don't be afraid to greatly exaggerate all movements. To be able to do this is one of the great benefits of animation, and it helps give cartoons their unique appeal.

EXERCISES

Here are several exercises that will aid your understanding of the principles we've been talking about. They do not require artistic skills. Rather, they use simple lines to challenge your understanding of motion. They can be done using DeluxePaint III because that package combines both paint and pageflipping features. If you don't have DPaint III, any paint program will do, but you will also need some type of animation program. PageFlipper Plus or Cel Animator will allow you to see the finished project in motion.

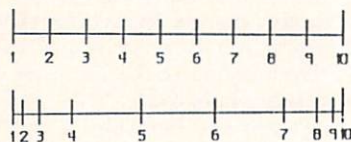
Your artwork can be as simple or as complex as you choose to make it. I recommend starting with simple characters and objects so that greater results can be seen in a shorter time. And work in lo-res while practicing, for the same reason.

However, and this is a very important point, when doing professional work or when creating samples to show to professionals, do everything in high resolution. To the video professional, anything less than hi-res looks as though an amateur did the work. One possible exception: if more than 16 colors are essential, work in intermediate (interlaced) resolution and antialias all jagged lines that are noticeable.

EXERCISE 1—FLAG

Draw a round dot connected to a line. Pretend that you are directly over a flag pole, looking downward. The dot represents the flagpole, and the line represents the top edge of a flag. Make a series of drawings to show the flag flapping in the wind. Make it into a cycle so that the action can run continuously. To do that, plan the series so that the last frame leads into the first frame.

This exercise may sound too elementary for you, but it's trickier than it appears. I have seen hundreds of students attempt this and have noticed one thing consistently. The people who can make this look right the first time have a natural eye for animation. As for the others, they may have to go outside and study flags for a while. Then, try again.



Illustrations I and II

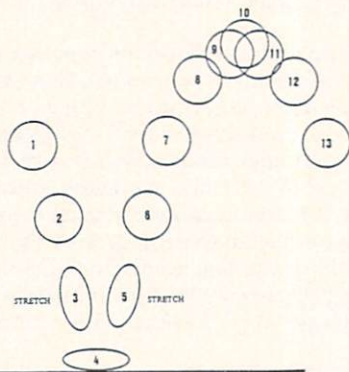


Illustration III

character walks along, his pot belly bounces up and down with each step. This is a reaction to the action of walking.

If a character is hit in the stomach, chances are his hat will fly into the air. The hit is the action; the hat into the air is a reaction. When a cannon shoots, the action is the cannonball flying into the air; the reaction is the recoil of the barrel.

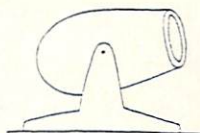
EXERCISE 2—HAPPY FACE

Draw a "happy face", a round circle with eyes and mouth, and make it bounce up and down like a ball. Draw one complete cycle and let it run continuously. Practice "stretch" and "squash" at the bottom, also "slow in" and "slow out" at the top. To make it more interesting, give appropriate expressions to the face.



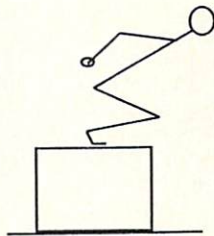
EXERCISE 3—CANNON

Draw a cannon and have it shoot a cannonball. It doesn't have to look like a real cannon. Cartoon cannons are acceptable. Here you have a choice. You can either practice "wind up" and "follow through" or "action" and "reaction". If you have the time, do both versions and study the difference.



EXERCISE 4—JUMP

Draw a stick figure of a person standing on a box. Have him jump off the box and onto the ground. This is not a cycle, so start with a "hold" on the first frame, and end with a "hold" on the last frame. This is easy to do with DeluxePaint III. Just show the first frame, then when you're ready, press key number 5 to go through the animation one time and stop on the last frame. Press the number 2 key to return to the first frame again.



If you have finished reading this lesson and have done all the exercises, then you have taken a major step toward improving your animation skills. To continue, make up some new exercises and take the time to practice. And remember to have fun with it, as you prepare for ...

PART II: THE WALK

The first animated films were made by drawing every detail of each frame on paper. You can imagine the tremendous amount of time and patience this required, because most films are comprised of thousands of frames.

When the cel was developed, it proved to be a major timesaver. The background could be painted just once and used throughout an entire scene. Only the objects or characters that moved were painted on these cels, which were then overlaid onto the background.

It's probably easier to see how the cel process can be applied to the computer if we select a single scene from a script and follow it step-by-step to completion:

Scene 35—Full frame—Zeke cheerfully walks along a country path, left to right. 10 seconds.

That sounds simple enough. In this case, Zeke—a slightly overgrown mouse created by Chester Taylor—will remain in the middle of the screen, and the background will move.

An animator works on an animation disc which has sliding peg bars at both top and bottom. It also has a light underneath to allow him to see through several layers of tracing paper.

Briefly, here are the steps followed by professionals doing cel animation on film:

- (1) Draw the key positions of Zeke on punched tracing paper.
- (2) Draw the in-betweens.
- (3) Shoot a pencil test of the drawings to check motion.
- (4) Paint one cel and shoot it with color film to check the colors.
- (5) Take all pencil drawings to "ink and paint", where black lines are inked onto the front side of each cel and paint is applied to the back side.
- (6) Paint the background scene.
- (7) Fill out an exposure sheet based on the results of the pencil test and the soundtrack.

Animation With 3-D Professional

by David Duberman

The ideal 3-D design software would give you the feeling that you're actually able to reach into the 3-D space and directly manipulate objects with your hands—sort of virtual reality without gloves. 3-D Professional comes closer to that ideal than does most Amiga 3-D software today. You're able to adjust camera position, angle, and zoom as well as object position, rotation, and size interactively with intuitive controls that are the next best thing to being there. Included is an object editor with the usual lathe and extrude utilities plus loads of nifty surface options. The program's only major deficiency is the lack of point-by-point shaping control that professional digital sculptors require. Also, while the current version doesn't ray-trace, such a module is in the works and will be offered as a low-cost upgrade to registered 3-D Pro owners.

While offering both path and tweening animation capabilities, the former can be accomplished in the current version only via a script file. 3-D Professional includes a powerful script language with which you can supervise virtually every detail of animation creation without having to be there during generation. You can specify camera movement on the X, Y, and Z axes in absolute or relative amounts, or you can move the camera forward or backward by a certain amount, or have it follow an object. Other camera related commands include zoom, aim in a certain direction or at a specified point, and field of view. Script commands let you load, move, rotate, and shear objects, plus set lights' position, intensity, angle, and color. As with most programming languages, 3-D Pro's scripts can include loop control, and you can "expose a frame" at any point during script execution, so this is really the only way to accomplish complex animation with 3-D Pro.

The easy way to do animation with 3-D Pro is with the key frame capability. You simply set up each successive key frame, then use the Add Frame command to add it to the key frame list. When you're ready to generate the animation, just tell 3-D Pro how many frames to make between each key frame plus a few other details, and let it go to work. As with all 3-D animation programs, first each frame is generated as a still, then the frames are compressed into a standard (or sometimes custom) animation format, usually the ANIM format supported by AmigaVision, DeluxePaint III, and many others. In many cases this can be a time-consuming process, but almost always you can leave the computer unattended the whole time, and come back to a completed animation when it's done.

As with Sculpt, you can use tweening in 3-D Pro to simulate motion by simply repositioning objects in successive key frames, as well as causing shape changes. Unlike Sculpt's tweening, you can't vary the number of frames between different pairs of key frames. One feature of 3-D Pro's which Sculpt doesn't have is the ability to smooth out motion, eliminating the zigzag effect. While you can edit key frames, you can't edit the basic animation setup or keyframe list. If you want to make major changes to an animation setup, you're generally better off restarting from scratch. 3-D Pro also offers real-time rotate and move-through animation features in the object editor that are useful for previewing simpler scenes.

3-D Professional, price: \$499.95. Progressive Peripherals & Software, 464 Kalamath St., Denver, CO 80204, (303) 825-4144. Inquiry #222.

- (8) Send all cels, the background and exposure sheet to the camera room, where they are photographed one frame at a time.
- (9) Have the film processed, and a work print made.
- (10) Give the work print to the editor, who helps create the finished product.

This process takes a lot of time, a lot of people, and a big budget. By using an Amiga computer some of the above steps are eliminated, others go faster, and yet the end result can be comparable.

To do Scene 35 on an Amiga there are three possible ways to start:

- (1) make all drawings of Zeke on punched tracing paper and digitize them with Digi-View;
- (2) draw all positions of Zeke directly on the computer using a graphics tablet, such as Easy!; or
- (3) make one drawing on any white paper, digitize it, and do the rest of the frames on the computer by simply modifying the first frame.

Animation Station

by David Duberman

Animation Station from Progressive Peripherals and Software is the underdog of Amiga animation programs. It's been around a while and you don't hear much about it. But make no mistake—it's a powerhouse and doesn't deserve to be overlooked. It's bundled with Progressive's 3D Professional (see sidebar) but is also available separately.

When the program starts you're presented with a blank storyboard screen consisting of a vertically scrolling array of rectangular cells, with 36 visible at a time, occupying the center of the screen and various tool icons arrayed along either side. There are no menus. You can load ANIM-5 format animations in a variety of modes, including HAM and overscan. When loading an animation you can opt to have the program create a storyboard, which places a miniature representation of each frame's image in the corresponding storyboard cell. This clever approach makes it much easier to locate specific animation frames. You can see a cell's frame full-screen by double clicking on it.

Another of Animation Station's most useful features lets you automatically create an animation out of a series of consecutively numbered (in the file name) IFF image files. Now all I need is a DOS batch wildcard rename utility! And there are lots of other great features. You can pick up a brush from any frame or load it from a file and then animate it on top of the animation. Using the storyboard layout, you can easily cut, copy, and paste sequences of frames, as well as inserting blank frames. You can adjust timing of the animation on a frame-by-frame basis. You can also adjust each frame's color palette independently, moving from between frames from the palette requester. You can even create gradual color transitions across any number of frames!

Wait a second, there's more. You can reduce an entire animation or any number of its frames to one-fourth or one-sixteenth the original size (retaining the original aspect ratio) and place the mini-ANIM anywhere on the screen. You can have the animation scroll into or out of the screen in any of the four cardinal directions over any number of frames. You can flip frames vertically or horizontally. Mosaic performs a gradual pixelization on an animation over a specified series of frames. The motion blur effect only works on HAM animations. While that's not all Animation Station does, it's all we have room to tell you about. If you work with Amiga animations, you owe it to yourself to buy this immensely useful tool.

Animation Station, price: \$99.95. Progressive Peripherals & Software, 464 Kalamath St., Denver, CO 80204, (303) 825-4144. Inquiry #223.

The method you choose will depend on where your talents lie and what equipment is available to you. I have chosen the third method for this lesson because it brings together the artist's talent to draw on paper and the powerful features of the Amiga computer to complete the series.

Make the first drawing of Zeke in full stride, using a pencil on any white paper. It doesn't have to be punched because all the other drawings will be done on the computer screen. When the pencil drawing is complete, trace directly over the pencil lines with a fine point, black felt pen. Then erase any stray pencil marks.

Digitize with Digi-View, set for hi-res, black & white, "Line Art". If you have trouble getting good clean lines, I suggest using a better lens than the one that comes with the camera. I use an Ektar 25mm, and a Switar 16mm. Be sure there is plenty of light and that the light is uniform over the entire picture. Unless your lens is automatic, you'll have to set the exposure manually by watching the picture on the screen.

I highly recommend using hi-res in all animation projects, if at all possible. However, if you have only 1 meg of memory and no genlock, then work in lo-res and plan the scene so that it can be done in either 8 or 16 colors. This can be done on a 1 meg computer and can give very pleasing results for personal viewing.

Save the drawing to disk and label it ZW-0 ("ZW" is short for "Zeke Walking"). I number working drawings -0, -00, -000, etc., to indicate that they are not part of the finished animation.

Once ZW-0 is saved to disk it can be loaded into a paint program. An extra step is required here because Digi-View records black line art as color #1 and the white background as color #2. We need to reverse that. Here are the steps:

(1) If you are using DeluxePaint III, bring up the palette, select color #2, select EX (exchange), then select color #1. Now color #1 should be white and color #2 should be black.

(2) Select black as the background color, and pick up the character as a brush.

(3) Select white as the background color, and black as the foreground color. Press Shift, K to clear the screen. Press F2 to change the color of the brush to black, the foreground color.

(4) Position the brush character wherever you want him on the screen, then remove your hand from the mouse. Press the left ALT and Commodore keys simultaneously to paint a copy of the brush in that location.

At this point it's a good idea to clean up your lines (if they need it), so you should now change the format to 8 colors and save it again. 8 colors should be plenty, and by not choosing 16 we can save both chip memory and disk space.

This drawing should still be black lines on white background. I find that a soft green or blue background is easier on the eyes, so bring up the palette and make that change. No color will be added to the character until all drawings are complete.

Let's stop here and analyze exactly what motions we'll be creating. The obvious motion is that of the arms and legs. In the first half of the cycle, the left foot begins on the ground and steadily moves backward. At the same time the right foot lifts off the ground and moves forward. The second half of the cycle is identical to the first, except that the right foot is on the ground and the left foot is moving forward. As the arms swing they go through a similar cycle, but opposite to that of the legs.

The second motion to consider is the body and head bouncing up and down, as Zeke walks.

Thirdly, the body bounce is likely to cause the tail to flap up and down.

It takes about 16 frames to do a smooth walk cycle, so go to the menu bar and select ANIM—Frames—Set #. Then change the count to 16. Load ZW into Frame #1 and also Frame #9.

Now we can let the Amiga do some of the work for us. We know that Frames 1 and 9 are identical except that the opposite foot and hand are in front. This change can be done by adding a few lines and erasing a few lines. The fingers on both hands may also need to be altered, but with these minor changes Frame 9 is complete.

Before drawing the in-betweens, we need a guide for the ground and foot positions. Make a straight, horizontal line at ground level on Frame 1 (we'll want to erase this guide later). Make a vertical mark on the ground directly under the center of the front foot, and another under the center of the back foot. Make a third mark halfway between the other two. This is where his foot will be halfway through the stride. Keep subdividing the line until there are 9 marks. Note that 8 positions make up the full stride. When a foot reaches position 9—the last one to the left—the other foot is starting over at position 1.

Now, pick up a copy of this "ground guide" as a brush, and position it directly over the original. Remove your hand from the mouse so it can't move. Hold down the Commodore key (which is the left Amiga key on some computers), and then hold down the left ALT key. The computer will flip through all frames, painting the ground guide on each one.

Next we'll place the head and body on Frames 2 through 8.

We know that Zeke's head and body change very little throughout the walk cycle, except that they move up and down. Frame 1 is the lowest position and Frame 5 is the highest, when one leg is straight down. Pick up a copy of Zeke's head and body from Frame 1. Do not include the legs or ground guide. Now place the brush directly over the original drawing.

Hold down the shift key and move the brush upward 3 or 4 pixels. The shift key assures that the brush does not move right or left. Press key 2 to go to Frame 2 and lay down a copy of Zeke. Advance to Frame 8 and lay down another copy, in the same position.

Move Zeke upward again for Frames 7 and 3, again for 4 and 6, and again for 5. Anytime you want to see your work in motion, press key 4. The space bar will stop the action.

Now go through Frames 2 through 8, one at a time, redrawing the legs and arms in their proper positions, according to the ground guide. Compare each new drawing with the previous frame to assure continuity. Key 2 allows you to step forward through the frames one at a time, and key 1 takes you backward.

Elan Performer & Animation

by David Duberman

Elan Performer is an indispensable multipurpose graphics utility for anyone working with a variety of Amiga images and/or animations. Currently in release 2.0, it was created by Elan Design, recently noteworthy for having designed the interface software for Newtek's Video Toaster. One of Performer 2.0's particularly nice new features lets you load 24-bit IFF and Impulse (Turbo Silver) RGB and RGB8 images. They're displayed in HAM mode, and you can even save the converted HAM image if you like. Also new is extensive ARexx and MIDI support.

Ostensibly a keyboard-controlled slide show program, Performer really does much more. To get an idea of what it does, think of your keyboard as a list, starting at the top left with the F1 key and continuing across and down, ending up at the slash key. Each key can have an image file or animation attached to it simply by pointing and clicking. Once loaded, all images remain in memory (assuming you have enough, otherwise they're reloaded from disk each time they're displayed). By further editing using the mouse only, you can set the time each image is displayed to the nearest 1/30th of a second, and the speed at which each animation is displayed. Then by pressing the Escape key or double-clicking on any key on the onscreen keyboard, you can start the automatic presentation in the across/down order. To enter manual mode, just press any key to which an image or animation is assigned, and the image or animation's last frame remains onscreen until you press another key or restart the automatic sequence. You can also take control of the sequence with the mouse or keyboard, even reversing it (including animations!) if you like.

Performer supports animation creation and editing in a couple of interesting ways. First and most simply, if your paint/rendering/digitizing software doesn't support animation generation, you can use it to create a sequence of image files, then in Performer assign each file in the sequence to a successive key and play the frames back quickly in automatic mode. Of course, it helps to have a lot of memory for this. The default setting for the time each frame is displayed is five seconds, which is too slow for animation. It would be a lot of work to edit each frame's timing automatically, but fortunately Performer offers a quick way to set the timing interactively. Start the automatic display, then press each image's key in turn, each time followed by 0 on the numeric keypad. This sets each frame's timing to 1/30th of a second for the fastest possible playback.

Once you've assigned the sequence, you can actually create an animation from the images. Performer's most unique animation-related feature lets you append the currently displayed image, whether from a still or animation, to a new or existing animation with a keypress. There's a mistake in the manual instructions for doing this. Instead of pressing Amiga-A, then the key to which the frame is to be appended, you just press Amiga and the key to be assigned. So, for example, if you're playing back an animation at 10 frames per second and you press Amiga-J every second, you'll create an animation attached to the J key consisting of every tenth frame of the original animation. This animation, or any other loaded animation, can be saved to disk in any of a variety of formats, including ANIM 3, ANIM 5, and RIF, an uncompressed animation format.

Elan Performer 2.0, price: \$59.00. Elan Design, P.O. Box 31725, San Francisco, CA 94131 (415) 359-7212. Inquiry #224.

One more trip through the frames is needed to change tail positions. The tail should be in lower positions when Zeke is moving upward, and in higher positions when he is moving downward.

To save all frames, select Project, Save from the menu bar. When the requester appears, change the number of frames to 16 and title the project ZW-. In the ANIM mode, DPaint III will automatically number each frame, beginning with 001.

The remaining Frames, 10 through 16, will be identical to Frames 2 through 8 except that the opposite hand and foot will be in front. Go to Frame 10 and load ZW-002. In the load requester be sure the number of frames is set to 1. After the load is complete, go to Frame 11 and load ZW-003, etc.

Go through the new frames, one at a time, changing the few lines needed to swap right and left legs and right and left arms, just as you did with Frame 9, earlier.

Now it's time to erase the ground guides. Erasing them from all frames automatically is similar to painting them automatically. Pick up a copy of the ground

guide, carefully position it over the original, and remove your hand from the mouse. Hold down the Commodore key, then the right ALT key to erase.

Save the series as an ANIM file. ANIM files save and load much faster than individual frames. Check the action again. If he moves too fast, change the Frame Rate in the menu bar and try again; 10 or 15 frames per second should be about right.

Now it's time to add color. Bring up the palette and adjust colors 3 through 8 to fit the character and his clothes. In the case of Zeke, two shades of brown or tan will take care of his skin and fur. A soft white will be good for eyes and teeth; pants and eye pupils are blue, jacket is red, and his cap is blue with a yellow stripe.

Be careful not to oversaturate the colors; soft colors look more natural. The only way to get the colors exactly right for video is to look at a video monitor while adjusting colors.

Close the palette window and fill the color areas of all frames. Now that there is a full-color character to see, you may want

CORRECTIONS

It has been brought to our attention that the following errors appeared in the Fall/Winter issue of *AC's GUIDE To The Commodore AMIGA*:

MegAChip 2000, The BattDisk, Insider II, and KwickStart were listed under the company name Michigan Software; they all should have been listed as being available from DKB Software.

Also not listed from DKB Software is the product MultiStart II: which allows A500 and A2000 owners to install Kickstart V1.3 and V2.0 ROMs, switch between them with a keyboard and upgrade to the latest operating system and still stay compatible with your older software. No external wires or switches are required and is compatible with the MegAChip 2000. \$99.95 w/o ROMs
DKB Software, 832 First St., Milford, MI 48381 (313) 685-2383

IllumiLink 1.0 from Geodesic Publications was listed at \$27.00 and should have been priced at \$100.00.

We apologize for these errors, and hope that no major inconveniences were caused. We hope that these corrections are found to be helpful.

go back to the palette for some fine tuning. Save again as an ANIM file, and also as an AnimBrush.

Press key 4 to see Zeke walk in all his color splendor.

Of course the animated character is only half of the scene. The other half is the background, which, in this case, must be moving to the left as Zeke walks to the right. The final part of this article will deal with the moving background.

Animation With the Sculpt Family

by David Duberman

Sculpt-Animate 4D from Byte-by-Byte makes it relatively easy to create complex three-dimensional animations. Its little brother, Sculpt-Animate 4D Jr., also has powerful animation capabilities. The form of animation they share is called tweening or morphing. Tweening animation is great fun to play with because it lets you magically change objects from one shape to another, with the computer doing all the hard in-between work. So, for example, you could change a bust of Lincoln to a sphere and then to an automobile.

Sculpt-Animate 4D is a full-blown ray tracing and animation software package. Ray tracing is the process by which super-realistic computer-rendered 3-D images are created, complete with accurate rendition of reflections, shadows, and even refraction in curved transparent objects. In addition to tweening animation it can perform path animation. A path in this context is a line connecting a sequence of vertices. During animation creation objects move from vertex to vertex in each successive frame. Thus, you must create as many vertices as you have frames in the animation. The advantage to this method is that you can accurately depict acceleration and deceleration by careful placement of the vertices. In fact, since the object format is available, if you're of a technical bent, you can write software that creates accurate motion paths using physical principles. Unfortunately, the program doesn't let a path-bound object perform tweening, and vice-versa.

Sculpt-Animate 4D Jr. is an introductory 3-D modeling and animation package that doesn't include many of the bells and whistles of its older sibling, including ray tracing or even object smoothing. But it does have its powerful "Tri-View" object editor and, as mentioned, tweening animation. In tweening, you create "key cells" that contain objects at the extreme points of their position and/or shapes, then let the computer calculate in-between shapes and positions. Thus, you can use tweening to simulate any type of movement, rotation, and reshaping of objects.

Alas, the Sculpt family doesn't have the real magic (or at least the artificial intelligence) that would be required to convert any object into any other object. In other words, you can't take two independently created objects and expect one to turn into the other, at least not in most cases. Generally, you must first create a single object to be tweened with all the different ultimate shapes in mind. You save that, then reload it, and reshape it into the new shape, and save that. Load each shape into its respective key cell and let the computer create all the interim shapes over however many cells you specify. The more cells you use, the longer and smoother the tween.

4D and Jr. also let you tween colors. So, for example, you can smoothly morph a purple pyramid into a red sphere and then a yellow cube. Sometimes you must experiment with a color transition, as intervening colors may not be what you might expect. As with shape tweening, the more control you take over key cell creation, the smoother your animations are likely to be.

Sculpt-Animate 4D, price: \$499.95. Byte by Byte, Arboretum Plaza II 9442, Capitol of Texas Hwy. N., Ste. 150, Austin, TX 78759, (512) 343-4357. Inquiry #225.

Sculpt-Animate 4D Jr., price: \$150.00. Byte by Byte, Arboretum Plaza II 9442, Capitol of Texas Hwy. N., Ste. 150, Austin, TX 78759, (512) 343-4357. Inquiry #226.

PART III: THE MOVING BACKGROUND

We just described how to make a cartoon character walk. Our script calls for the character, Zeke, to stay in the center of the screen while the background moves from right to left. In this discussion, we will discuss three ways to do a moving background in a scene such as this. The options available to you are as follows:

- (1) Combine Zeke and the background into a single ANIM file;
- (2) Create a separate ANIM file for the background and add Zeke with a genlock; or
- (3) Use a live or painted background, shoot it with a video camera, and add Zeke with a genlock.

The method you choose will depend on your specific interests and facilities. The computer purist will probably choose the first method so he can play back the complete scene on a computer screen.

Those with a background in video and two VCRs will likely choose the second method, or the third method if equipped with a good video camera and tripod. The third method will also be the likely choice of experienced artists who enjoy working with real paint on art board.

MEMORY LIMITATIONS

Most of the high-end computer animation systems used by professionals, like conventional cel animation, require single-frame recording. This method bypasses many of the limitations of real-time animation; however, it is very time consuming and requires very expensive video equipment. For the budget-conscious video producer, real-time animation is money in the bank. That's what we're dealing with in this lesson.

Because real-time animation is so memory intensive, it is important for you to understand certain factors and thereby minimize the complications.

Chip memory: Only "chip" memory can display an image on screen. The many frames of an animation are juggled back and forth between chip RAM and fast RAM, because they must be in chip RAM before they can be shown on the screen. The speed at which a computer can juggle them back and forth determines the maximum speed at which the animation can run. In order to play a scene at normal speed there should be enough chip RAM to hold at least three frames at a time, as required for double buffering.

(continued on page 59)

ANIMATION CHART

As part of AC's most comprehensive animation issue ever, our editors have compiled the following chart comparing many features of 22 of the top Amiga animation packages available today.

Twelve Amiga product developers are represented in the chart; a number of other companies presently market a wide variety of Amiga animation programs and utilities. We regret that space limitations—considered along with the highly specialized nature of some of these other animation products—prevent us from including detailed descriptions and/or comparisons of all Amiga animation products and their features in this issue.

Nevertheless, we would like to acknowledge several of those products here: **The Talking Animator** (JMH Software), the only talking Amiga animation package; **CellPro** (MegageM), the only cellular automata art/animation system for the Amiga; and **Photon Video Cel Animator** (Microillusions), a module in the Photon Video collection that functions as a high-quality animation playback and sound synchronization tool.

In addition, several other companies failed to get back to us in time to make the chart. Among them was R & D L Productions, whose **Lightbox—The Drawing Tool for Animators** implements traditional methods of animation with increased productivity: a built-in flip function sorts and displays the previous and following drawings in sequence for reference.

As to the chart, a bullet (•) indicates a product has that feature, or requires the type/amount of memory indicated. Comments or footnotes in a box most often indicate a partial or related capability for the feature listed. Following are explanations for some of the fifty animation features listed:

ANIM Standard, Byte Vertical Compression, RIF Standard, Uncompressed are all animation file "standards". There being no set standard, ANIM is the most popular and widely used. Most play just the changes from frame to frame to save memory. Uncompressed sometimes uses more memory to actually flip frames, but it produces a more uniform speed.

Bluing/onion skin refers to the traditional technique that displays previous frame(s) during creation of the current frame.

Extra Halfbrite, IFF Support, HAM mode are display modes; HAM produces more colors, but requires much more memory.

Internal Genlock Support means there is genlock control from within the program.

Path Animation takes an object along a path created from specified start/finish points.

Player indicates a separate animation player—which saves memory—is included.

Self-Running creates animations that can be run outside of the program.

Severe Overscan/User-adjustable overscan are best for broadcast TV use.

Tweening causes an object to "transform" to another automatically.

Velocity/ease simulates movement delays, such as a ball slowing slightly near the peak of its ascent.

MANUFACTURER	Progressive Peripherals & Software		OXXI/Aegis			
PRODUCT	3-D Professional	Animation Station	Aegis ANIMagic	Aegis ProMotion	Aegis Videoscape 3D with ProMotion	Spectra Color
1 Meg Chip RAM	•	•				
1 Meg+	•	•		•	•	
24-bit Color Output	•	N/A		N/A		
2-D Animation	N/A	•	•	•	•	•
2-D Texture/IFF Mapping	N/A		N/A			•
3-D Fonts	•	N/A		as objects	as objects	
3-D Object Animation	•	N/A		•	•	
3-D Texture/IFF Mapping	•	N/A		N/A		•
68020/30 Support	•		•	•	•	•
8SVX/IFF Sounds	N/A	•		N/A	N/A	
ANIM Cut-and-Paste	•	•				•
ANIM Standard	•	•	•	•	•	•
ANIMbrushes						•
Antialiasing	•	N/A		N/A		N/A
ARexx Support						
Bitplane Conversion	N/A	•	•	N/A	•	
Bluing/Onion Skin						
Byte Vertical Compression	•	•				
Color Remap	•		•			•
Color Fonts			•	as objects	as objects	•
Digital Video Effects			•	N/A	•	•
Extra Halfbrite			•	N/A	•	
Fades/Wipes/Dissolves	•		•			•
Frame Controller	•	•				•
HAM mode	•	•	•	•	•	•
IFF Support	•	•	•	•	•	•
Internal Genlock Support	•	•	•	N/A	•	
Light Sources	•	N/A		•	•	•
Multiple Color Cycle	N/A		•			•
Overscan	•	•	•	•	•	•
PAL Standard Support	•	•		N/A		•
Path Animation	•	N/A	•	•	•	•
Perspective	•	N/A		N/A	•	•
Phong/Scanline Shading	•	N/A				N/A
Player	•	•	•	N/A	•	•
Ray Trace Rendering	•	N/A				N/A
Resolution Conversion	N/A	•	•	N/A	•	•
RIF Standard	•	•				
Scrolling Background Option			•	N/A	•	
Self-Running						
Severe Overscan	•	•	•			•
SMUS Songs	•					N/A
Standard Amiga Fonts	•		•	as objects	as objects	•
Stencil/Mask/Matte						•
Storyboards	N/A	•				
Tweening	•	•				•
Uncompressed			•	•	•	•
User-adjustable Overscan	•		•			
Velocity/Ease						
Wireframe Preview	•	N/A	•		•	•

• = YES

MANUFACTURER	Octree Software		Electronic Arts		Walt Disney Computer Software
PRODUCT	Caligari Broadcast	Caligari Pro Animate	DeluxePaint III	DeluxeVideo III	The Animation Studio
1 Meg Chip RAM			•	•	
1 Meg+	2MB	3MB	•	•	
24-bit Color Output	•				
2-D Animation			•		•
2-D Texture/IFF Mapping	•		•		
3-D Fonts	•	•			
3-D Object Animation	•	•			
3-D Texture/IFF Mapping	•				
68020/30 Support	•	•	•	•	
8SVX/IFF Sounds				•	•
ANIM Cut-and-Paste					•
ANIM Standard			•	•	•
ANIMbrushes			•	•	•
Antialiasing	•		•		
ARexx Support				•	
Bitplane Conversion			•		
Bluing/Onion Skin					•
Byte Vertical Compression			ANIM-5 supported	ANIM-5 supported	
Color Remap			•		•
Color Fonts			•	•	•
Digital Video Effects			•		
Extra Halfbrite	•	•	•	•	
Fades/Wipes/Dissolves				•	
Frame Controller	•	•			•
HAM mode				•	
IFF Support	•	•	•	•	•
Internal Genlock Support	•	•			
Light Sources	•	•			
Multiple Color Cycle			•		•
Overscan	•	•	•	•	•
PAL Standard Support	•	•	•	•	1
Path Animation	•	•	•	•	
Perspective	•	•	•		
Phong/Scanline Shading	•				
Player			•	•	•
Ray Trace Rendering					
Resolution Conversion	•	•	•		•
RIF Standard					
Scrolling Background Option				•	
Self-Running					
Severe Overscan	•	•		•	•
SMUS Songs				•	•
Standard Amiga Fonts			•	•	•
Stencil/Mask/Matte			•		•
Storyboards	•	•			
Tweening					
Uncompressed	•	•			•
User-adjustable Overscan				•	•
Velocity/Ease	•	•	•		
Wireframe Preview	•	•	•		

• = YES

1) Two separate versions: one for PAL and one for NTSC; 2) Does not use ANIM format, but provides for conversion

MANUFACTURER	Mindware International			Impulse	
PRODUCT	Digimate 3	Pageflipper Plus F/X	PageRender 3D	Imagine	Turbo Silver
1 Meg Chip RAM				•	•
1 Meg+				•	•
24-bit Color Output				•	•
2-D Animation	•	•		•	•
2-D Texture/IFF Mapping				•	•
3-D Fonts			•		
3-D Object Animation			•	•	•
3-D Texture/IFF Mapping				•	•
68020/30 Support			•	•	•
8SVX/IFF Sounds					
ANIM Cut-and-Paste	•				
ANIM Standard	•	2	•	•	•
ANIMbrushes					
Antialiasing				•	•
ARexx Support	•		•		
Bitplane Conversion					
Bluing/Onion Skin					
Byte Vertical Compression					
Color Remap				•	•
Color Fonts					
Digital Video Effects	•			•	•
Extra Halfbrite	•	•	•		
Fades/Wipes/Dissolves	•	•			
Frame Controller					
HAM mode	•	•	•	•	•
IFF Support	•	•	•	•	•
Internal Genlock Support				•	•
Light Sources			2	•	•
Multiple Color Cycle		•			
Overscan	•	•	•	•	•
PAL Standard Support	•	•	•	•	•
Path Animation			•	•	•
Perspective				•	•
Phong/Scanline Shading				•	•
Player	•	•	•	•	•
Ray Trace Rendering			•	•	•
Resolution Conversion					
RIF Standard					
Scrolling Background Option		3			
Self-Running	•	•	•		
Severe Overscan	•	•	•	•	•
SMUS Songs					
Standard Amiga Fonts					
Stencil/Mask/Matte				•	•
Storyboards					
Tweening				•	•
Uncompressed				•	•
User-adjustable Overscan	•	4	•	•	•
Velocity/Ease			5	•	
Wireframe Preview			•	•	•

• = YES

3) Scrolling background not automated; 4) Adjusts to the images provided by the user; 5) Velocity easily created with variables in scripts

MANUFACTURER	Gold Disk	Byte by Byte		The Right Answers Group	Centaur	Antic Publishing
PRODUCT	Movie Setter	Sculpt-Animate 4D	Sculpt-Animate 4D Jr.	The Director	Forms in Flight 2	Zoetrope
1 Meg Chip RAM						
1 Meg+		2 meg min sugg.	1 meg min sugg.			
24-bit Color Output		•				
2-D Animation	•	BkGr/ FrGr		•		•
2-D Texture/IFF Mapping						
3-D Fonts		6				
3-D Object Animation		•	•		•	
3-D Texture/IFF Mapping					•	
68020/30 Support		•		•		
8SVX/IFF Sounds		•	•	•		
ANIM Cut-and-Paste				•		•
ANIM Standard	•	ANIM-5, J-OP	ANIM-5,J-OP	•		
ANIMbrushes	•			•		
Antialiasing		•		9		•
ARexx Support				•		
Bitplane Conversion						
Bluing/Onion Skin				10		•
Byte Vertical Compression				•		
Color Remap				11		
Color Fonts				•		•
Digital Video Effects				•		•
Extra Halfbrite				•		
Fades/Wipes/Dissolves	•			•		•
Frame Controller		•				
HAM mode		•		•		
IFF Support	•	•	•	•	•	•
Internal Genlock Support		•				
Light Sources		ambient & point	ambient & point			
Multiple Color Cycle	•			•		•
Overscan		•	•	•	•	
PAL Standard Support		7	7	•	•	•
Path Animation		•		•		•
Perspective	•	•	•			•
Phong/Scanline Shading		•			•	
Player		•	•	•		•
Ray Trace Rendering	•	•				
Resolution Conversion						
RIF Standard						•
Scrolling Background Option				10		
Self-Running	•			•		
Severe Overscan		•		•		
SMUS Songs				•		
Standard Amiga Fonts	•			•		
Stencil/Mask/Matte	•	BkGr/FrGr		•		•
Storyboards						•
Tweening	•	•	•	•		
Uncompressed	•			•		•
User-adjustable Overscan		8		•		
Velocity/Ease				10		
Wireframe Preview	•	•	•			•

• = YES

6) Font object library support; 7) Automatic & manual overrides; 8) 24-bit mode only; 9) Program is written with inherent capabilities;

10) Similar effect can be implemented; 11) Not complete remap; limited palette mapping

(Cartoon Animation, continued from page 54)

Resolution: Hi-res pictures require about four times the memory of lo-res, because they have four times as many pixels to control. The HAM mode is not recommended for animation because of the excessive amount of memory required for every frame.

Bitplanes: Another major factor is number of colors in the palette, as determined by the number of bitplanes in use. Eight colors, representing 3 bitplanes, use considerably less memory than 16 colors, or 4 bitplanes.

Complexity of scene: Finally, the complexity of a scene and the motion within determines how much memory is needed. In the ANIM format, the many frames of an animation are not held in memory individually. Instead, the first frame goes to memory and thereafter, only the pixels which change from frame to frame are recorded. So if only a few pixels change, very little memory is used, and the scene can run faster and longer.

This is also the way an ANIM file is saved to disk, so an animation scene that fills up one disk in the ANIM format probably needs two or three disks to hold all the frames when saved individually.

Now let's examine the three different methods of doing a moving background, noted above

THE COMBINED SCENE

This method can be performed on a 1-meg Amiga if it is done in lo-res with 8 or 16 colors. Although it can be done in hi-res on a 3-meg computer, instructions here will refer to lo-res only.

With its excellent animation features, DeluxePaint III is the only software needed. Since DPaint III will not animate in overscan, this exercise is mostly for practice; the result will not meet broadcast standards.

Be sure that you have saved Zeke Walking as an AnimBrush, in lo-res. Change format to lo-res, 16 colors, and frame size to 320 x 200. Clear all frames, if they're not already clear, and set number of frames to 80. The movement of the background is smoother if it moves the same number of pixels on every frame. And since there are 320 pixels, horizontally, it can move completely across the screen in 80 frames, at 4 pixels per frame.

Zeke Walking uses only 8 colors, so when you load the AnimBrush, Zeke will use the first column of 8 colors. The 8 colors of the second column are available to change and use for the background without affecting Zeke.

Go to Frame #1 and paint the background scene. Plan the scene so that it can loop, continuously. That is, match the left edge of the picture to the right edge, perfectly. That is, the horizon, mountains, and other features should meet the left edge of the picture at exactly the same height as they do the right edge of the picture. Then, when two copies of the picture are placed end to end the landscape will appear to be continuous, with no abrupt changes.

It's easy to check this alignment by selecting the rectangle tool. This gives the brush a perfectly horizontal line across the screen. Of course, you will need to press F10 to hide the toolbox in order to see the right edge.

Keeping the memory problem in mind, it's a good idea to plan the background so there are large areas of solid colors and no large areas of textures. Keep vertical lines to a minimum.

When the background scene is complete, and while the toolbox is still hidden, press key "b" to activate the brush selector. Incidentally, the keyboard equivalents are the best timesavers you have. I recommend that you make a conscious effort to use them regularly.

Pick up the entire picture as a brush. Be sure to go all the way to the corners. Press ALT and "x" simultaneously to place the brush handle at the lower right corner, and again to place it at the lower left corner. Press upper case "K" to bring up the clear screen option, and select "All Frames".

Position the background scene back in its original position, filling the screen. To do this, place the cursor—the brush handle—as far as it will go into the lower left corner of the screen, and press the left mouse button.

Press the "u" key to undo, or remove the background. It may appear that we just cancelled out the previous step, but not so. The computer remembers where you painted the scene and will begin its motion from that location.

Press F10 to restore the menu bar and toolbox. In the menu bar select ANIM, move, to bring up the move requester. Everything in the move requester can remain in its default setting except that the X Distance should be set to -320. Also be sure that the count says 80. Then select draw.

Turbo Silver Animation

by David Duberman

Turbo Silver is one of the best bargains in Amiga graphics software today. It's a high-caliber 3-D rendering, ray-tracing, and animation program with lots of advanced capabilities for under \$100. It comes with a free floating-point version for those lucky enough to own accelerator cards, but it's very fast even without acceleration. One of Turbo Silver's main claims to fame is its ability to wrap IFF images around 3-D objects for special effects not available in other Amiga rendering programs.

If you buy Turbo Silver from a store, you get version 3.0. For \$30 you can upgrade to 3.0SV from Impulse, Inc. and I strongly urge you to do so. Improvements include a hi-res wireframe editor, improved modeling capabilities, and support for the IFF ANIM format as well as the stereo Haitex X-Spex. Incidentally, if you use 3.0SV to generate an ANIM format animation, make sure you generate all the frames in a single session with Lock Palette on, or you'll have trouble playing back the animation with programs that don't support ANIMs with multiple palettes, like DeluxeVideo III. At this writing Impulse is on the verge of releasing Imagine, which is a major revamping of Silver, but the original is still very much worth having.

Silver uses a method of path animation that's markedly different from Sculpt-Animate 4D's approach. A path's structure is the same in both programs—a series of vertices connected by edges. Unlike Sculpt, however, you can't reverse a path's direction. Also, a path in Silver needn't contain the same number of vertices as the number of frames through which the object is to move. Silver uses interpolation to move the object through equal-length segments of the path before each frame. The drawback of this procedure is that it's more difficult to simulate acceleration and deceleration. Also, since Silver moves the object before each frame, it's sometimes difficult to know exactly where the object will start in the first frame. You can get around this by generating the animation to all but the first frame, then copying the key frame (or the second frame) to the first frame and setting it up as desired.

Silver uses a requester called Story to assign an object to a path. Story incorporates a number of unique features that can be a great deal of help in generating complex animations. First, an object can be scaled and/or rotated on any combination of the three axes, using either the object's own axes or the constant world ones. The rotation/scaling settings can be absolute, in which the specified total amount is spread out over the number of frames in the animation, or relative, in which the specified amount is applied on each successive frame. Next, the Story command's Y Align feature forces the object's Y axis to lie along the path's direction, constantly rotating the object if necessary. This is handy for animating aircraft and other vehicles. Finally, the Follow Me feature lets you assign a group of objects which will follow each other along the path in the order you specify, which gives a train motion!

Turbo Silver 3.0, price: \$199.95. Impulse, Inc., 6870 Shingle Creek Parkway #112, Minneapolis, MN 55430, (612) 566-0221. Inquiry #227.

Now you will have to wait till the computer paints all 80 frames, one at a time, while moving the picture to the left. By the time it reaches frame number 80 the picture has moved completely off the screen. So it's time to fill in the blank areas with another copy of the same background scene, which is still on the brush.

Go to Frame #1 and again press F10 to hide the Menu Bar and Toolbox. Position the brush as far as it will go into the lower right corner of the screen, and press the left mouse button. You will not be able to see any of the brush in this position, but remember, the computer knows where it is.

From the menu bar select ANIM, move again. Without changing anything in the move requester, select draw again, and watch as the computer paints the picture into the blank areas of all frames.

Now the moving background is complete and you can check it out with key 4. It should move smoothly and continuously, as though it is one endless scene. Save it to disk as an ANIM file, labeled ZW-BG.

With ZW-BG still on the screen, go to Frame #1 and load the lo-res AnimBrush of Zeke Walking. Position Zeke where you want him in the frame. Composition-wise, it's best to place him slightly off center, facing toward the center of the frame.

When Zeke is positioned, paint a copy of him there and select undo. Go to the move requester, set all distances and angles to zero, set the number of frames to 80, and select preview. When you are confident that

he is staying in the right position, press the space bar to stop the preview, then select paint. After Zeke is painted onto all frames, save the complete scene as an ANIM file using a fresh, formatted disk, because this one scene will use a large portion of the disk.

Press the 4 key to see the complete animation. If Zeke walks too fast, reset the frame rate. If he walks too slow, then the speed is probably being limited by your computer configuration, and there's nothing you can do until your system's memory is expanded.

SEPARATE ANIMS

This method requires a genlock, 2 VCRs, DeluxePaint III, and DeluxeVideo III. We will record the moving background onto videotape, then play it back through the genlock, adding Zeke Walking from the computer. The combined animation can then be recorded on another VCR.

We will use the hi-res ANIM of Zeke Walking and combine it with an intermediate-res (interlace) background scene in overscan.

We're now getting into a picture quality that is acceptable for professional video applications, with the character in hi-res and the background in what appears to be hi-res. I say that because, in a landscape such as this, most of the lines are horizontal or near-horizontal. And in inter-res, near-horizontal lines have no more aliasing than hi-res, because of the shape of each pixel. And the 32 colors are enough to allow for extra shading and detail.

Set the format to interlace, overscan, in 32 colors. Change the page size to 704 x 480, which is exactly twice as wide as normal overscan. In animation terms this is 2 fields wide. Hold down the left cursor key to be sure you are seeing the left end of the page.

Paint the background scene on the spare page, which is still 352 x 480 in size. The left edge should match the right edge, just like before. It is all right to include much more detail than we were able to use in the first method, because the computer will not be overworked by playing two ANIMS at the same time. When the background scene is complete, save it to disk as ZW-BG-0. After the "save" is finished, press upper case J to copy it to the other page. Then press small j to see the other page. This is the extra wide page which will become our final background.

Hold down the right cursor key until the scene stops moving. This should bring us to the right half of the page, which is blank. Press j to return to the spare page, then upper case J to copy the picture again. Return to the oversize page and hold down the left cursor key. If the right and left edges were matched correctly then you will not be able to see where the two pictures meet. They will appear to be one continuous picture. Save as ZW-BG-1. The background is now complete.

The next step is to record the moving background on videotape. Warm boot the Amiga with the DeluxeVideo III, Maker disk. Open the program. Double click on the view icon and select overscan. This establishes the area of the screen we will see in terms of lo-res, even though our picture will be in int-res. Lengthen the scene to 1 minute by dragging the right arrow. Double click on the scene icon.

Drag down a track icon, choose picture and load ZW-BG-1. Drag an effect icon down to the track and start it at .05 sec. Select show. Drag a second effect icon to the track, select scroll and set the controls to X=4, Y=0, T=2. This controls the speed of movement. You can set it faster by increasing the X value, or slower by decreasing the X value. Drag the start arrow of the scroll to .05 seconds, and the end scroll arrow to the end of the scene, which should be 1 minute.

In the menu bar select project, play scene. The background should move smoothly for one minute. If everything looks all right, play the scene again while recording it on videotape. If you're using VHS, record at standard play (SP) speed for best picture quality.

The final step is to play back the tape, feeding it to the video-in jack on the genlock, and at the same time play the hi-res ANIM of Zeke walking, using DeluxePaint III. If you have another VCR, connect it to the overlay or video-out jack of the genlock, and record the combined scene.

ANIM OVER LIVE BACKGROUND

This method requires a genlock, a video camera and tripod, one or two VCRs, a TV, and DeluxePaint III. We will use the hi-res anim of Zeke Walking, and combine it with a painted background, or a live background. This method also gives broadcast quality to the scene. The

Memory & Animation

by Chris Boyce

THE FIRST RECOMMENDATION most experts make when giving advice on creating Amiga animation is that you have a lot of memory. Unfortunately, many Amiga owners would like to experiment in the world of animation, but don't have megabytes and megabytes of memory to work with. So, they give up before even getting started. But this doesn't have to happen. By following a few simple steps, you can learn to more effectively utilize your system's available memory. By choosing the right software and using it properly, even users with 512K can create animations of substance.

Those with one megabyte will learn how to create longer, more complex animations.

Most Amiga users have a favorite resolution in which they prefer to work. Some like high resolution because there are less "jaggies". Others prefer lower resolutions or HAM because they can use more colors on the screen at one time. If you intend to transfer your final product to videotape, remember to use interlace (i.e., 320 X 400, 640 X 400); it's necessary to maintain videotape stability. However, if your animation is only for playback on the computer screen, consider using a non-interlaced display (i.e., 320 X 200, 640 X 200). You'll find that not using interlace gives you about twice as many animation frames to work with. As for which resolution to use, keep in mind that the higher the resolution, the more memory required. A hi-res 640 X 400 screen uses about twice the memory of a 320 X 400 screen, and you only can have half the number of colors on the screen at once. Many people are attracted to the large number of colors available in HAM mode. But you really should avoid it, unless you actually need all the colors it provides, because it also uses much more memory. Try to get by using 32 colors. If you select your palette carefully, you'll likely discover that 32 colors are plenty.

One final mode to keep in mind is overscan. Depending on the degree of the overscan, it can use in the range of 30% more memory. Use it only when absolutely necessary.

NUMBER OF COLORS

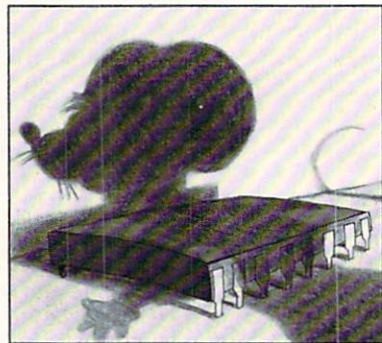
The more colors in your palette, the more memory you're going to find being gobbled up. Get by with as few colors as possible. If you don't need those 32 colors, don't even select a 32 color palette. Bear in mind that fewer colors means a simpler, less distracting animation. Using a two-color palette instead of a 32-color palette gives you five times as many frames to work with. One technique works especially well for animated titles and credits. Have the text and other objects "fly in" using just a two-color palette (i.e., black text on a white background). Then, once all of the components are in place, take the final screen of the animation, save it separately, increase the number of colors in the palette, and colorize it. If you have a slideshow-type program such as Lights!Camera!Action!, you can have that program play the animation and do a transition, such as a fade or wipe to the colorized screen. In the end, it appears that the black-and-white creation has been touched by a magic paintbrush and instantly colorized.

PROGRAM MEMORY USAGE

One frequently overlooked, yet obvious solution is to cut down on the amount of memory being used by the animation program itself, and any other programs that may be running at the same time. Don't multitask. The more programs running (even very small ones), the less room you'll have for an animation. Close all unnecessary windows, and if possible close Workbench. If you're using a program such as DeluxePaint III, it's possible to load only a portion of the program into memory at one time. The problem with this method is that often as you select a new command, the computer will have to access the disk drive, thus causing a delay. But you will free up more memory to work with.

COMPRESS YOUR ANIMATION

If you try to create an animation with full-sized IFF screens you're not going to be able to fit many screens into memory before you run out of room. That's where file compression comes into play. The "ANIM" method of animation compression is currently the most popular compression format and is also the closest the Amiga comes to an animation



compression standard. ANIM works by saving the first IFF screen of a file and then saving only the changes in frames thereafter. If your animation program is not compatible with the ANIM standard, but can generate IFF frames, you can use the public domain program MakeAnim to compile the IFF frames into an ANIM file.

There is one inherent problem with using ANIM. The more changes between the frames of your animation, the slower the playback program will cycle through the individual frames. In some cases, it can slow down to the point that you can easily notice a jump between frames. Be sure that the changes between frames are minimal, and playback will almost always be acceptable.

DISPLAY RATE

Animation works by tricking our eyes into blending individual still frames that are displayed in quick succession to create the illusion of motion. Many animation programs allow you to choose the rate (measured in frames per second) at which your animation is displayed.

To get perfectly smooth animations, we might aim for a rate of around 30 frames a second, a rate that a lot of programs (especially ones using the ANIM format) can't achieve anyway. If perfectly smooth animation is not an absolute necessity, we can reduce the number of frames displayed every second, and the fewer frames displayed, the less memory needed.

Ten frames a second is about the bare minimum you can go to before the illusion of motion begins to fall apart. By choosing 15 frames per second we are generating only half the number of frames required at a rate of 30 frames a second. The choice is up to you, and you'll have to decide what sacrifices in playback smoothness you can make. A little bit of experimenting should help you see the differences.

PIECING IT TOGETHER

If an animation's final destination is videotape, you may be able to break it into smaller sections, which can be edited together when you record it onto tape. How successful this method is largely depends on what type of video equipment you're using. If you're using professional equipment, it shouldn't be a problem. Most professional systems are very close to frame accurate. If you're using consumer equipment and have an editing controller and flying erase heads, it shouldn't be too difficult, either. Just record the animation onto tape and edit it together at the proper points. The only trick is knowing where to make the breaks when you're creating the animation so that there aren't any jumps when the entire piece comes together. If you don't have an editing controller, it might be worth renting time on one somewhere. Otherwise, you can record one piece, pause the VCR, unspool, record the next piece, pause, etc. How accurate this will be depends on the machine and your sense of timing. Chances are, it will be difficult to make smooth cuts using this method.

SINGLE-FRAME RECORDING

If you have a VCR capable of recording a single frame at a time and a controller for it that's hooked up to either the parallel or serial ports, this is a not-too-difficult way to conserve memory.

Programs such as Photon Video Transport Controller and Videoscape 3D can drive these controllers to automatically record a frame as soon as the computer has generated it. If you don't have a controller hooked up to your Amiga, you can display the frames manually and have the VCR record them for a frame as you display them.

GENLOCKED BACKGROUND

If you have a genlock, you can save valuable memory by creating your background separately from the foreground animation. This is easy if the background is static. If it moves or changes in tandem with the foreground it's just a little more difficult. When you're done with the animation, record the background onto videotape. Then, play back the tape with the background, genlocking (keying) the foreground animation over top of the prerecorded background. Just make sure that when creating the foreground animation you make the background color Color Zero so that you can use it with the genlock.

SELECTING YOUR SOFTWARE

Some software operates in a low-memory environment better than others. Two programs you might want to check out are MovieSetter and Fantavision. MovieSetter is easy and fun to use. It creates cartoonish animations of considerable length even on 512K machines. Fantavision uses a tweening method of animation where you create the keyframes, to produce decent length animations with surprisingly little memory. When you're shopping for animation software, certainly check out how well the software performs in a low-memory environment. By using your available resources properly, and making a few sacrifices here and there, you can create Amiga animations without a load of expansion memory. You will not have the same ease and flexibility more memory would provide, but you won't have to spend any more money, either.

animated character is in hi-res, while the background takes advantage of the maximum resolution allowed by your camera, and an infinite number of colors and shades.

The technique is so simple that instructions are not needed. However here are a few tips that might improve the final results. The painted background should be at least 4 fields wide. For taping it should be placed on a wall and the center of the picture should be exactly the same height as the camera lens.

Use a solid tripod with a fluid head for best results. Back up the camera as far as is practical from the picture, and use the lens in a telephoto position. Both picture and tripod head should be perfectly level. Use plenty of light on the picture.

The video signal from the camera goes directly to the video-in jack on the genlock. The video-out from the genlock goes to the video-in of a VCR, and it should be hooked to a TV so you can see the combined scene. Load the ANIM Zeke Walking and let it run continuously. Practice panning the camera several times before recording the scene on tape.

If you choose a live background, it should be recorded on tape while the camcorder is moving at a walking pace. The camera and tripod can be mounted on a car, a golf cart, an ATV, wagon, wheelchair, or anything else that can roll smoothly. And the camera should be looking 90 degrees to the left of the vehicle. As in the second method, the taped background is played back through the genlock, and Zeke is added from the computer.

This completes your short course in cartoon animation. Whichever method you choose, I hope it serves both as a learning experience and a source of inspiration, encouraging you to tackle more and varied projects. Animation still holds a fascination unmatched by live drama, and cartoon characters never become obsolete because of dated fashions or fads.

•AC•

Product Information

3-D Professional Price: \$499.95 Inquiry #222	DeluxePaint III Price: \$149.00 Inquiry #228	Sculpt-Animate 4D Price: \$499.95 Inquiry #225
Animation Station Price: \$99.95 Inquiry #223	DeluxeVideo III Price: \$149.95 Inquiry #230	Sculpt-Animate 4D Jr. Price: \$150.00 Inquiry #226
Progressive Peripherals & Software 464 Kalamath St. Denver, CO 80204 (303) 825-4144	Electronic Arts 1820 Gateway Drive San Mateo, CA 94404 (800) 245-4525	Byte by Byte Arboretum Plaza II 9442 Capitol of TX Hwy. N. St. 150 Austin TX 78759 (512) 343-4357
Aegis ANIMagic Price: \$139.95 Inquiry #243	Digimate 3 Price: \$39.95 Inquiry #253	The Director Price: \$129.95 Inquiry #248
Aegis ProMotion Price: \$99.95 Inquiry #244	PageFlipper Plus F/X Price: \$299.00 Inquiry #254	Right Answers Group P.O. Box 3699 Torrance, CA 90510 (213) 325-1311
Aegis Videoscape 3D with ProMotion Price: \$199.95 Inquiry #245	PageRender 3D Price: \$159.95 Inquiry #255	MovieSetter Price: \$99.95 Inquiry #247
Spectra Color Price: \$99.95 Inquiry #246	Mindware International 110 Dunlop W. Box 22158 Barrie, Ontario, Canada L4M 5R3 (705) 737-5998	Gold Disk, Inc. 5155 Spectrum Way, Unit 5 Mississauga, Ontario Canada L4W 5A1 (416) 602-4000
OXI/Aegis Development 1339 E. 28th St. Long Beach, CA 90806 (213) 427-1227	Digi-View 4.0 Price: \$199.95 NewTek 215 E. 8th St. Topeka, KS 66603 (913) 354-1146 Inquiry #229	The Animation Studio Price: \$179.95 Inquiry #207
Caligari Broadcast Price: \$3495.00 Inquiry #251	Forms in Flight 2 Price: \$119.00 Inquiry #249	Walt Disney Computer Software, Inc. 500 S. Buena Vista St. Burbank, CA 91521 (818) 567-5360
Caligari Pro Animate Price: \$1995.00 Inquiry #252	Centaur Software Inc. P.O. Box 4400 Redondo Beach, CA 90278 (213) 542-2226	Zoetrope Price: \$139.95 Inquiry #250
Octree Software, Inc. 311 West 43rd St Suite 904 New York, NY 10036 (212) 262-3116	Imagine Price: \$350.00 Inquiry #256	Antic Publishing 544 Second St. San Francisco, CA 94107 (415) 957-0886
	Turbo Silver Price: \$199.95 Inquiry #227	
	Impulse, Inc. 6870 Shingle Creek Pkwy #112 Minneapolis, MN 55430 (612) 566-0221	

Programming in AmigaBASIC: the shotgun approach revisited

by Mike Morrison

SO, YOU READ LAST MONTH'S ARTICLE on implementing a shotgun approach to AmigaBASIC (AB) (*Amazing Computing*, December 1990, pp. 44-45) and you still want to learn how to program in the language. You probably want to use it to solve some of life's most complex problems like: When does then become now? How much tea is in China? And how many Frenchmen does it take to change a light bulb?

RECURSION

In order to solve these problems and many more we will need to use recursion. You may be wondering what recursion is. What recursion is. What recursion is. Recursion is when you do something repeatedly. Over and over. The same task again and again. An example of this would be your daily routine. Your alarm goes off, you get up, bathe, get dressed, grab a cup of coffee, take an aspirin for your headache, shut off your alarm (no wonder you had a headache), and drive to work. All this to find out that it's Saturday. This is recursive because you do it every day, over and over, till you die.

SKIN A CAT

As in skinning a cat, there are many ways to program recursion. We'll take a look at the worst way first and then a few alternatives:

```
sentence1$="Your alarm goes off. You get up."  
sentence2$="You bathe, get dressed, and have a cup of coffee."  
sentence3$="You drive to work."  
sentence4$="Over and over till you die."
```

```
here:  
PRINT sentence1$  
PRINT sentence2$  
PRINT sentence3$  
PRINT sentence4$  
GOTO here
```

After you type this in RUN it. Your life will pass in front of your eyes. This program will actually run forever unless we stop it. When you're done gazing at your life press the Ctrl key (above the left shift key) and the letter C at the same time (or select Stop from the menu). This will halt our little program.

In the above example we used a label named HERE (you can use any word or numbers for labels), and the AB command GOTO. The program starts at the beginning and assigns the text between the quotes to the string variables to the left. Then AB

encounters the label HERE which it remembers and then goes to the four PRINT statements. The PRINTs display the contents of the variables which we assigned at the beginning. Then the GOTO statement is reached. This tells AB to go to the label named HERE. HERE is just above the PRINT statements. Then the PRINTs print, and the GOTO sends the program back to the HERE label. This continues forever.

THE FOR AND NEXT COMMANDS

Another approach to the previous example would be to use the FOR/NEXT loop. The FOR command and the NEXT command work together to form a loop. Let's rewrite our example using a FOR/NEXT loop:

```
sentence1$="Your alarm goes off. You get up."  
sentence2$="You bathe, get dressed, and have a cup of coffee."  
sentence3$="You drive to work."  
sentence4$="Over and over till you die."
```

```
FOR x = 1 TO 100000  
PRINT sentence1$  
PRINT sentence2$  
PRINT sentence3$  
PRINT sentence4$  
NEXT x
```

Using the FOR/NEXT loop produces the same results as the GOTO and HERE label above. All except for one thing. The above FOR/NEXT loop will continue until the variable X is greater than 100000. The FOR command starts the X variable out at 1. The PRINTs are executed and AB reaches the NEXT command. This tells AB to go back to the associated FOR command. First, AB checks to see if the variable X is greater than the second part of the FOR command, in this case 100000. If it is then AB would not go back to the FOR command but would continue to the next command after the NEXT command (in this case there is no command after the NEXT so the program would end).

In this next example (no pun intended) we will use a different variation of the FOR/NEXT command.

```
PRINT "Prepare for the shuttles launch."  
FOR seconds_left = 10 TO 1 STEP -1  
PRINT seconds_left  
NEXT seconds_left  
PRINT "Blast off!!!!"
```


NEW!

Trumpcard Professional...

the Frontrunner in SCSI disk controllers

*State of the art users deserve
state of the art hardware*

Trumpcard Professional is a new generation SCSI controller card for the new generation of 20 Megabit per second drives. While Trumpcard Professional is incredibly fast with drives of any speed, its performance is unmatched with the new generation drives, up to an unprecedented 1.9 MEGABYTES per second with

DPERF2! Trumpcard Professional is state of

the art. From its surface mounted custom gate array for swift, smooth and seamless data transfers to its new TCUTILS 2.0 utilities with the look and feel of the new WB 2.0, Trumpcard Professional sets a level of performance and functionality others can only aspire to attain.

- Auto mounts all partitions up to 1 minute after RESET, slow partitions don't hold up autoboot.
- Full support for removable media built into autoboot ROM. No need for DISKCHANGE.
- Full implementation of RDB's and standard Direct SCSI interface.
- User selectable Trumpcard SCSI ID for SCSI bus arbitration allows multiple computers to share hard drives.
- Supports all drives at 1:1 interleave for fastest data transfers possible.
- Full Mac emulator support.
- 1 year warranty on parts and labor.

Naturally, Trumpcard and Trumpcard 500 owners can upgrade with IVS' Trumpcard plus \$100 upgrade policy. Call IVS for details. Upgrade available from manufacturer only.

Trumpcard Professional
List Price: \$279.95



TRUMPCARD PROFESSIONAL

Trumpcard 500 Professional is available for A500 users.
NEW!
Lower Price on Standard A2000 Trumpcard!
\$169.95

AC's TECH Dealers

AC's TECH For The Commodore Amiga is available now at the following Amazing Dealers. If your local Amiga dealer is not on this list - tell them they should be! If you are an Amiga dealer and would like to carry AC's TECH at your location, or you can't find AC's TECH in your area, call us toll free at:

1-800-345-3360

Best Electronics Anchorage, AK	The Creative Edge East Ketchum, ID	Professional Micro Systems Baltimore, MD	Page One Newstand Albuquerque, NM	Lauer Todd Computer Solutions Newtown, PA
Alabama Computers Etc. Huntsville, AL	D Software & CADDs Bloomington, IL	Software Advantage Rockville, MD	Computer World Las Vegas, NV	North Digital System Danville, PA
The Computer Image Birmingham, AL	Franco Computers Peoria, IL	Skylight Software Belfast, ME	Computer House Sparks, NV	Pittsburgh Computer Store Pittsburgh, PA
Commodore Connection North Little Rock, AR	Megabyte Computer Works Springfield, IL	Better Mousetrap Computers Flint, MI	M.A.S.T. Sparks, NV	Software Hut Philadelphia, PA
Computer Concepts Gosnell, AR	Micro Tek Bradley, IL	Book Nook Allen Park, MI	Amagination New York, NY	Some Hole in the Wall Philadelphia, PA
Capri Products Company Burlingame, CA	Micro Ed Enterprises Chicago, IL	Book Center of East Detroit East Detroit, MI	Global Software New Hyde Park, NY	Micro Limits Warwick, RI
Commodore Land Alhambra, CA	Ring Software Geneva, IL	Direct Access Novi, MI	Leigh's Computers New York, NY	Software Connections Warwick, RI
Computer Nook San Bernadino, CA	Software Plus Wheeling, IL	Michigan Software Novi, MI	McAleavy's Newstand Somerville, NY	The Computer Place Woonsocket, RI
Dataphile Watsonville, CA	Software Plus Chicago Chicago, IL	Norman Business Control Systems Grand Rapids, MI	Peavy's Enterprises Latham, NY	AVCOM International West Columbia, SC
Harding Way News Stockton, CA	Software Plus West Hanover Park, IL	Rite Way Computers Warren, MI	Ray Supply Plattsburg, NY	A&E Software Groves, TX
KJ Computers Granada Hills, CA	Computer People Michigan City, IN	Slip Disk Madison Heights, MI	The Microworks Buffalo, NY	Lee Kaplan Metropolitan Computer Richardson, TX
Micro Galaxy Santa Rosa, CA	Computer Products Unlimited Ft. Wayne, IN	Slipped Disk New Baltimore, MI	The Computer Cellar Albany, NY	Software Library Wichita Falls, TX
Amazing Computers of Denver Inc. Denver, CO	CPU Inc. Indianapolis, IN	Softwarehouse Kalamazoo, MI	Video Computer Center Rome, NY	The Computer Experience San Antonio, TX
Computer Discount Denver, CO	Digital Arts Bloomington, IN	Ye Olde Computer Shoppe Ypsilanti, MI	Video Computer Inc. Rome, NY	Discovery Fairfax, VA
Infotronics S. Woodbury, CT	Xerox Computer Center Indianapolis, IN	JMH Software Maple Grove, MN	World Wide News Rochester, NY	University Bookstore Blacksburg, VA
Amazing Computers Tampa, FL	Von's Computers West Lafayette, IN	Miller Computer Service St. Paul, MN	Fairborn Home Computer Fairborn, OH	Virginia Micro Systems Woodbridge, VA
Amicomp Computer Center Oviedo, FL	Mr. Horan's Computer Lab Louisville, KY	Specialists In Hopkins, MN	Infinity Computing Columbus, OH	Nibbles & Bytes Tacoma, WA
Commodore Country Pinellas Park, FL	Computer Works Middleton, MA	Valiant Inc. Stillwater, MN	Merical Computers Centerville, OH	Omni International Seattle, WA
Computer Image Miami, FL	HCS Computer Center Pembroke, MA	National Computer Center Ocean Spring, MS	North Coast Programming Willoughby, OH	Tech Star Kent, WA
Computers Plus Daytona Beach, FL	LCA Video & Computer Center Norwood, MA	Computers R Us Lincoln, NE	Second Hand Software Oklahoma City, OK	Computer Software Center Milwaukee, WI
Software South Inc. Savannah, GA	The Memory Location Wellsley, MA	Double E Computer System Omaha, NE	Comm Shack Salem, OR	Fox Valley Personal Computers Oshkosh, WI
Techno World St. Mary's, GA	Tycom Inc. Pittsfield, MA	Digital Connection Computers Dover, NH	Computer U.S.E.R.S. Springfield, OR	TMW Computer Center Wausau, WI
The Musician Macon, GA	Buried Treasure Rockville, MD	System Eyes Nashua, NH	ATD Software Sayre, PA	SDA Computers Hurricane, WV
The 64 Store Atlanta, GA	Capital Classics Silver Springs, MD	Garden State News Cliffside Park, NJ	Circle Computer Ephrata, PA	
ABI Computer & Video Nampa, ID	New Age Computers College Park, MD	Manta Inc. Software Concepts Eatontown, NJ	Computer Basics Hermitage, PA	
		Village Computer Center Cedar Knolls, NJ	Electronic Connection Reading, PA	

AC's TECH / AMIGA

For The Commodore

Technically Speaking,
It's the First.

*Check out the
premiere issue,
on sale now:*

✓ All Amiga!

✓ All technical!

✓ All original!

✓ All programs
included on disk!

Contents

January, 1991

Vol. 1 No. 1

- ◆ Advanced Disassembling: Magic Macros with ReSource
- ◆ Building the VidCell: 256 Grey-Scale Digitizer
- ◆ An Introduction to Interprocess Communication with ARexx
- ◆ An Introduction to the ilbm.library
- ◆ The Use of Recursive Programming Techniques in Conjunction with DOS and EDIT for Hard Disk Backup
- ◆ The FastBoot Super Boot Block: Creating a Bootable, Recoverable RAM Disk
- ◆ AmigaDOS for Programmers
- ◆ Adapting Mattel's PowerGlove to the Amiga
- ◆ Using Proportional Gadgets from Absoft's FORTRAN

✓ Be sure to get your copy today ...
before they're ALL GONE!

Get the Premiere January 1991 Issue for \$14.95.
Charter One-year Subscription – Four Issues – only **\$39.95!**
(limited time only)

AC's TECH – from the Amiga technical information publishing leader – P.i.M. Publications, Inc.

Continue the Winning Tradition With the SAS/C® Development System for AmigaDOS™

Ever since the Amiga® was introduced, the Lattice® C Compiler has been the compiler of choice. Now SAS/C picks up where Lattice C left off. SAS Institute adds the experience and expertise of one of the world's largest independent software companies to the solid foundation built by Lattice, Inc.

Lattice C's proven track record provides the compiler with the following features:

- ▶ SAS/C Compiler
- ▶ Global Optimizer
- ▶ Blink Overlay Linker
- ▶ Extensive Libraries
- ▶ Source Level Debugger
- ▶ Macro Assembler
- ▶ LSE Screen Editor
- ▶ Code Profiler
- ▶ Make Utility
- ▶ Programmer Utilities.

SAS/C surges ahead with a host of new features for the SAS/C Development System for AmigaDOS, Release 5.10:

- ▶ Workbench environment for all users
- ▶ Release 2.0 support for the power programmer
- ▶ Improved code generation
- ▶ Additional library functions
- ▶ Point-and-click program to set default options
- ▶ Automated utility to set up new projects.

Be the leader of the pack! Run with the SAS/C Development System for AmigaDOS. For a free brochure or to order Release 5.10 of the product, call SAS Institute at 919-677-8000, extension 5042.

SAS and SAS/C are registered trademarks of SAS Institute Inc., Cary, NC, USA.

Other brand and product names are trademarks and registered trademarks of their respective holders.



SAS Institute Inc.
SAS Campus Drive
Cary, NC 27513

Circle 126 on Reader Service card.

In this example you probably noticed two things different from the last example. One, we used a variable called SECONDS_LEFT instead of X. Second, we used the STEP part of the FOR command. In this example the variable SECONDS_LEFT is started with a value of 10. The PRINT command displays the value of SECONDS_LEFT and AB reaches the NEXT command. AB checks to see if SECONDS_LEFT is less than the second part of the FOR command, this time it is 1. 10 isn't less than 1 so AB goes back to the FOR command. Now the variable SECONDS_LEFT is decremented by 1 because of the STEP -1 part of the FOR command. This makes the value of SECONDS_LEFT at 9. Eventually SECONDS_LEFT will be less than 1 and the program won't go back to the FOR command but will continue to the next PRINT command.

WHILE AND WEND COMMANDS

This time we will rewrite the last example using the WHILE/WEND commands. You will see that they are somewhat similar in function as the FOR/NEXT commands.

```
seconds_left = 10
PRINT "Prepare for the shuttles launch."
WHILE seconds_left <> 0
PRINT seconds_left
seconds_left = seconds_left - 1
WEND
PRINT "Blast off!!!!"
```

The first line sets the value of the variable SECONDS_LEFT to 10. The WHILE and WEND loop will continue until the equation supplied with the WHILE command becomes false. In this case the loop continues until SECONDS_LEFT does not equal 0 (the "<>" signs mean not equal to). At this point SECONDS_LEFT is equal to 10, and 10 does not equal 0 so the loop continues.

When we used the FOR/NEXT loop, the FOR command automatically incremented or decremented the variable supplied. With the WHILE command we must do it ourselves. This is done with the SECONDS_LEFT = SECONDS_LEFT - 1. Before this statement SECONDS_LEFT equals 10. Then we subtract 1 from SECONDS_LEFT which is 9. Then we put that value back in SECONDS_LEFT. Then AB encounters the WEND command and the program is sent back to the WHILE command. Once SECONDS_LEFT is decremented to 0 the loop will end.

There are many ways to program recursion, and many are much more complicated. Take a look at other programming articles that have highlighted recursion. What we covered this month should give you a good start on recursion and looping. These ideas are used often in programming and you should take the time to understand them and experiment. Here is one more quick example using the WHILE/WEND commands. Before you run it take a guess at what you think will happen. (Clue: the computer looks at any value other than 0 as being true.)

```
WHILE 1
PRINT "Forever is a long time...."
WEND
```

•AC•

C NOTES

From the C Group by Stephen Kemp

THIS COLUMN HAS BEEN DEDICATED for some time now to teaching the C programming language. Now it is time for a test. Most of the code examples and questions that follow will focus on areas that cause the greatest number of problems and/or bugs. To simplify the grading process, the answer to each test question will be supplied immediately following the question. But, don't cheat! Think about your answer before reading mine.

Question: How do you declare a string variable in C?

Answer: Did you think about the answer before you started reading this? In any event, this first one was a trick question. There is no "string" variable type in C. Technically, you must declare a character array and only logically treat it as a string (i.e., `char var[30];`). I suppose this question wasn't really fair if the C language is the only one considered. Some other languages, however, do offer "string" variable types that are distinguished from arrays of characters and this was the point that I wanted to make.

Question: Consider the following declaration: `char * var[5];`

This declaration defines: A) a character array of length 5; B) an array of 5 pointers where each points to a char; C) a pointer to an array of 5 characters.

Answer: The answer is B—an array of character pointers. This is a common stumbling block for many novice C programmers, but even an expert can trip over it occasionally. Typically, this type definition is mistaken for a pointer to a character array — especially when seen in a prototype without the array index (`char * var[]`). It is usually mistaken because we read left to right while variable definitions should be evaluated from right to left. Starting from the right, you first see the array brackets; the variable name

can be skipped and that leads to the pointer indicator (*); finally, the far left reveals the char data type. This means we have an array of 5 pointers — each pointing to a char.

Question: What is wrong with the following code? There may be more than one item amiss. Try not to concentrate on what the code is trying to accomplish and concentrate only on finding any syntax and/or logic problems.

```
set_message( void )
{
    char message[5];
    char *ptr;
    int ndx;

    ptr = "Hello";
    for( ndx = 1; ndx <= 5; ndx++ ) {
        message[ndx] = *ptr;
    }
    return(message);
}
```

Answer: There are five distinct problems in this function: 1) The assignment of the variable array, `message`, begins in the second element position. Remember: Array indexes begin with the zero element. Since `message` is a local variable, and not yet initialized, the zero element will contain an undetermined value. The "for" loop in this example should begin with:

```
for( ndx = 0;
```

2) Trying to index into the array with an index of 5 (the last execution of the loop) will exceed the defined array length. Again, recall that array indexes start with the zero element. This means that the "maximum" index is one less than the constant used to declare the variable. The loop should be written to terminate when the index 5 is reached:

THIS IS A TOASTER

THIS IS A TRAINING TAPE ON THE TOASTER

TeleGraphics International, creators of exceptional instructional tapes is proud to present its latest training Series on NewTek's remarkable Video Toaster.

Order Volume One from Amiga Dealers or contact
TeleGraphics International
 605 Dock Street, Wilmington, NC 28401
 (919) 762-8028

Mastercard & Visa accepted. Suggested retail: \$49.95

Circle 156 on Reader Service card.

```
for( ndx = 0; ndx < 5; ndx++) {
```

3) The character pointer, ptr, is initialized to point at the word "Hello", yet the pointer is never incremental beyond the first character. This means that each element of the character array, message, will contain the letter "H" (except the first position which was skipped) and not the word "Hello". To correct this situation, we can change statement 9 to read:

```
message[ndx] = *ptr++;
```

4) The function was not defined as returning a character pointer which we have to assume is intended by the return statement. By default, it will assume an integer return value. This means that, even if the compiler did not balk, the function would only return the integer portion of the address of the variable message. If a pointer must be returned, the function should be declared like this:

```
char * set_message( void )
```

5) Even if the function is declared to return a pointer, returning a pointer to a local variable is not appropriate. Once a function completes (returns), the local stack space where variables were declared becomes technically "undefined". Whenever a function must return a pointer, it must be a pointer of a global variable or

the pointer must have been "based" on some variable passed to the function.

Although there may be several other more subtle concerns regarding this function, I believe these are the 5 primary flaws. Did you discover them all? If so, did you know how to correct the problems?

Question: Assume the variable x is an integer. What value would be computed for x in the following equation?

```
x = 3 + 4 * 8;
```

Answer: 35. Remember the precedence of math operators. Multiplication is higher than addition, therefore 4 will first be multiplied with 8. Then 3 will be added to the result.

Last Question: Can you find any flaws in the following function?

```
void print_value( long num )
{
    printf("The value is = %d.\r\n",num);
}
```

Answer: There is only one problem in this function. The parameter variable, num, is declared as a long type. When printing longs using the printf function, the format character(s) supplied in the format string must specify this fact. This is accomplished by placing the letter "l" (for long), between the format indicator (%) and the data type indicator (d). The result should look like this:

```
printf("The value is = %ld.\r\n",num);
```

It is possible that this function only requires the short integer portion of the parameter. If this is the case, then the function should still be changed to look like this:

```
printf("The value is = %d.\r\n", (short int) num);
```

If the casting operation is omitted (as it was in the test question) then an incorrect number of bytes will be pushed onto the stack. In this example, it may go undetected. If, however, you were attempting to print more than one variable within this particular function call, passing the incorrect number of bytes would interfere with the subsequent printed values.

That concludes the test for this month. How did you do? Of course, these few questions could not come close to testing your knowledge of the C language. Specifically, I tried to concentrate on the most frequently encountered problems. If you missed one or two, do fret too much. Now you know what you need to work on. Don't wait to make a mistake in an important program: do a few experiments now, to clear up any confusion.

•AC•



ROOMERS

by The Bandito

[The statements and projections presented in "Roomers" are rumors in the purest sense. The bits of information are gathered by a third-party source from whispers inside the industry. At press time, they remain unconfirmed and are printed for entertainment value only. Accordingly, the staff and associates of Amazing Computing™ cannot be held responsible for the reports made in this column.]

ONCE AGAIN, IT'S TIME for The Bandito's fearless predictions for the New Year. You may recall that last year The Bandito successfully predicted that Elvis would be found living with Jimmy Hoffa under an assumed name, that Jack Tramiel would lose 50 lbs. on a diet he learned from space aliens, and that Commodore would decide not to buy Apple Computer. An impressive track record, to be sure, but let's see if it can't be beaten this year.

And so, without further ado, here are The Bandito's "Fearless Predictions for 1991":

(1) Commodore's CDTV will beat CD-I to market, even though CD-I has had several years' head start. By the end of the year, over 100,000 CDTV units will be sold. More than 200 CDTV-format software titles will be available by the end of the year.

(2) The price for an A500 and monitor will drop to below \$500 by the end of the year, causing sales to jump more than 50%. The Amiga 500 will begin to find its true destiny as the rightful heir to the C-64 as the home computer of the 1990s.

(3) Commodore will introduce at least one 68040 machine and a full 24-bit graphics card. Prices will be lower than that for similar machines from other manufacturers, but they will not be cheap.

(4) Workbench 3 will be announced for shipment in 1992. Among the new features will be support for 24-bit graph-

ics, outline fonts, multiple monitors, and virtual memory.

(5) The Amiga will become the machine of choice for video professionals, primarily due to the success of the Video Toaster.

Mark those predictions down on your calendar. And now, some current news from the wonderful world of Amiga.

YOU MAY REMEMBER The Bandito mentioning some troubles at Mediagenic. Well, the company has finally taken some drastic steps to fix things. Mediagenic has undergone a major reorganization, starting by resetting their 1991 sales goals from \$60 million to \$30 million and getting rid of around 50 people. They've also sold some of their businesses to get some operating capital, and renegotiated some of their debt to give them some breathing room.

Will this massive belt-tightening work? Only time will tell, but Dr. Bandito says this patient is in bad shape. To the discerning eye, Mediagenic looks like Mindscape did before it was bought out by Software ToolWorks: a poor selection of software titles, but with the rights to produce more Nintendo carts than it can make. In other words, a very attractive buyout target, although there are a huge pile of liabilities. Mediagenic may well be in such bad shape that it can only continue in business as is, since that's the only way its creditors can ever hope to see any of their money.

SO WHAT'S HAPPENING at the Big C itself these days? Well, Commodore formally announced its A2410 graphics card (that's the card developed at the University of Lowell) and Unix V Version 4 at a European trade show. Both were shown running on an A3000, doing some graph-

ics demos with impressive speed, and attracting many admirers. The Bandito has discovered that AMIX (Amiga Unix) is being beta tested by several different universities. Expect to see it available by early 1991. Commodore has high hopes for the UNIX market, although the Bandito thinks that UNIX should be classified as a curable mental condition and heavy UNIX users should be put through detox programs. Hey, it makes MS-DOS look elegant, OK? The definitive propeller-head operating system. Why anyone wants to mess up an Amiga by running UNIX on it is a mystery. Maybe Dale Luck can provide an answer...are you out there, Dale?

Anyhow, the A2410 card uses the TI 34010 graphics chip to give you a maximum resolution of 1024 x 1024 pixels (with a hi-res monitor) and 256 colors from a palette of 16 million. With Commodore's new 1950 multiscan monitor you can get a resolution of 800 x 800 pixels. Not bad for a little old Amiga, and at a very reasonable price, too. At least, the Bandito hears that the price for the A2410 will be well under \$1000; let's hope that prediction comes true.

Commodore has finally entered the portable computer business! No, not with a portable Amiga, but a portable PC built by Sanyo. Seems Commodore is still trying to keep that MS-DOS line of computers alive. What about a portable Amiga? It's possible, but not likely any time soon, according to The Bandito's sources. Prototypes have been built, but the market still isn't there yet. We likely won't see one for a long time, unless it comes out from a third-party manufacturer.

The Bandito hears many strange things floating past on the endless datastream. One of the strangest concerns a possible deal between Commodore and Sun (those Unix workstation hotshots).

It's bizarre, but The Bandito will pass it along for your amusement. It seems that Commodore might take over Sun's Intel- and Motorola-based workstation business, as a way to get into the Unix market if the A3000 doesn't set the Unix world on fire. So, Sun would concentrate on its Sparcstations, while Commodore would inherit the machines that aren't selling all that well (the ones based on 80386's and 68030's).

HOW'S THE SOFTWARE business going lately? Glad you asked. The Software Publishers Association reports that DOS/Windows, Macintosh, Apple II, Amiga, Unix, and OS/2 formats all posted sales gains, but Commodore 64/128 software sales plummeted by 32.7 percent. For some strange reason, Apple II software sales grew 10 percent for the first half of 1990 after dropping like a stone last year; The Bandito believes it's due to the stubborn education market. Certainly there's not much developmental effort there. Have you looked at an Apple II magazine lately? If you can find one, you'll see that it's thinner than the average politician's integrity. Just not much to talk about or advertise in the Apple II business these days. Meanwhile, Amiga software sales shot up 34 percent, with word processing up 80 percent. The Bandito hears that ProWrite has been doing very well lately.

THINGS ARE HEATING UP in the hardware market. Some new players have entered, and we can expect to see some battles for position. GVP is at the top of the heap right now, but Applied Engineering is coming in with their guns a-blazin'. California Access, best known for their 3.5" add-on drive, also has a slew of hardware products headed for the marketplace. And that's just the big players in this new market war. The Bandito expects some heavy advertising salvos to be fired, and some innovative new hardware to be developed. And don't be surprised if the competitive pressures start forcing prices down. Gee, that wouldn't be too bad, now would it?

Laser printer prices are already plummeting; you can find several models for under \$1000 now, and prices are still heading downward. The Bandito thinks that Commodore should bring out that laser printer (the one they've been fooling

with in the labs) under their own label with a killer price tag. Of course, a color laser printer would be the perfect companion for the Amiga, don't you think? Or maybe just a good color inkjet for under a thousand dollars. Make that one where the ink cartridges don't cost an appreciable fraction of the national debt, will you? Thanks.

In other hardware news, tape backup systems (once found only on mainframes or MS-DOS computers) are making their way into the Amiga market. Several are in development; it's now going to be a lot easier to back up your hard drive. Prices shouldn't be too much higher than for MS-DOS tape backup; figure somewhere around \$700.

THE NEW CHEAP MACINTOSH lineup has Commodore a bit worried. The Macintosh LC is a 68020-based machine that will sell for about \$2,300 (street price) with a 40 MB hard drive and 2 meg of RAM. It does 256 colors out of 16 million at a resolution of 512 x 384; in fact, if you add some video RAM, it can do 32,000 colors at that resolution. This one's aimed squarely at the Amiga 2500, and Commodore won't take it lying down. The one drawback to the Mac LC is that it won't be out in big numbers till February or so, giving Commodore time to prepare its countermeasures. The Bandito expects large price cuts on the A2000 line in response.

Of course, the Amiga isn't the only computer threatened by the new Macs. The Apple IIe, IIc and the IIGS are all on the chopping block when the Apple IIe emulator card for the Mac comes out in March. Apple officials are dropping ever more pointed hints about the coming demise of the Apple II, though they're trying to be cagy enough to get rid of all their inventory. Looks like we won't have the Apple II to kick around anymore after next year. So much for "Apple II Forever".

What can Commodore do to keep the A2000 competitive? Well, a redesign of the motherboard would substantially reduce costs by combining chips into VLSI chips, and using surface mount technology to reduce production costs. Designing a case that's easier to construct would also help reduce costs. Perhaps they could even develop a case that's easy to remove with a few snaps, rather than a bunch of

screws. How low-tech! And a little design sense, like that shown with the A3000, would help immensely. Right now the A2000 looks like an industrial designer who specializes in tanks produced it in his spare time.

And while you're at it, Commodore, you can go ahead and turn that stupid monochrome video jack right back into a standard NTSC output. Sure, it wasn't the greatest signal in the world, but it made the computer ideal for video right out of the box. Now, you have to pay extra for that capability. Of course, that's really what you need to do for the A500, too.

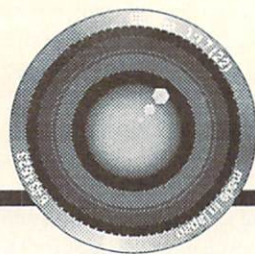
While The Bandito is looking at the A500, maybe a motherboard redesign there would save some money, too. Look into getting a better power supply, too. It would be nice if you could make the unit lighter, and perhaps even design it to accept a snap-on LCD screen to make it portable. Really, it could be made small enough to fit into a briefcase, and certainly light enough. Now there's the way to bring the world a portable computer! And if you could find a way to stuff in an internal Zorro slot and room for an optional battery pack, you'd really be cookin' with gas.

WHILE WE'RE ON THE TOPIC of hardware manufacturers, NeXT is probably the only PC manufacturer who's sold fewer units than Commodore. Their new machines may do better, though. The price is lower and the performance is higher, and they finally added color. Still no games for them, though, and what's a computer without some games? The Bandito predicts that the NeXT machines will become the LavaLites of the 1990s: cute, expensive toys that get relegated to the attic.

The European market that has been so strong for many Amiga developers may experience a slump next year, according to some. Seems that sales of all kinds of computers are lower than the heady growth rates experienced in the last few years, and this naturally affects the sales of peripherals and software.

That's it for this month. I hope to have even more inside information next time, although breaking through security seems to be getting harder and harder...

•AC•



SNAPSHOT

by R. Bradley Andrews

SHADOW OF THE BEAST II & THE KILLING GAME SHOW

Psygnosis has carved out an interesting niche for themselves. All their games make use of high-quality graphics and rather bizarre themes. Two of their recent releases continue in this trend, and are sure to provide many hours of challenge to Amiga players.

Shadow of the Beast II is a sequel to the original game. It seems that the evil lord is furious about your success over his minions in the first volume. The saga continues with his kidnapping of your little sister; now, you are her only hope. As this game begins, you are positioned just outside the edge of the Dark Realm and you must fight your way through waves of foes who attempt to kill anything that moves. Armed with just a simple mace at the start, other weapons become available for pick-up or purchase along the way.

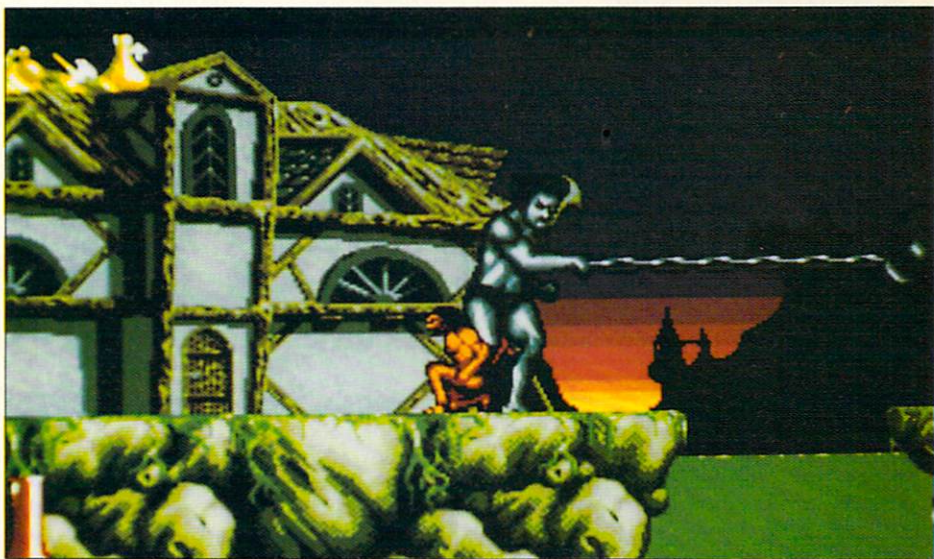
The Killing Game Show, also from Psygnosis, casts the player as a contestant in a life-and-death struggle for survival. The player must find his way through level after level of hostile forces, quickly working his way to the exit at the top of the screen. The player's craft begins with a simple gun, but modules are scattered about each level and shooting them produces different weaponry.

Each level is also continually filling up with a liquid that is hostile to all forms

of organic life, providing even more incentive to work quickly through the current level.

Both of the Psygnosis games take a fairly long time to master. The graphics and scrolling of each game are smooth and fabulous, and the sound effects and music are integrated well into both.

finally catch up with them. An included desk encyclopedia will be vital to your task of connecting the various clues to the proper location in time and space. The graphics are about equal to those in Where in Europe is Carmen Sandiego?—sharp and easy to read. The textual descriptions of each site are interesting and may add to



Shadow Of The Beast II

WHERE IN TIME IS CARMEN SANDIEGO?

Broderbund Software's Where in Time is Carmen Sandiego? is now out for the Amiga. It seems the same old gang of thieves that were pillaging Europe are now haunting the corridors of time.

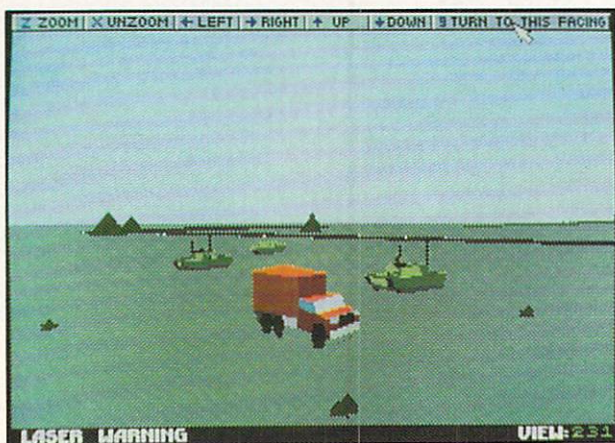
You begin each case at the scene of a crime and, by matching clues provided by witnesses, you follow the thieves from city to city throughout history until you

your present understanding of the various places that have played an important role in history. The mouse is used for all game input.

While the the program has the makings of a game, its foundation is as a creative learning device. Anyone who manages to track down enough criminals to get promoted to the highest levels of the detective agency will also come to learn a good deal about world history.

Last month in "Snapshot", the photo used to illustrate the game Street Rod, by California Dreams, was not that of the Amiga version, but rather the C-64. We apologize for this oversight.

top to bottom: Where In Time Is Carmen Sandiego?, Jack Nicklaus' Unlimited Golf & Course Design, M1 Tank Platoon



JACK NICKLAUS' UNLIMITED GOLF & COURSE DESIGN & JACK NICKLAUS PRESENTS THE MAJOR CHAMPIONSHIP COURSES OF 1990

Accolade has released their latest golf simulation for the Amiga, and an accessory disk for it. Jack Nicklaus' Unlimited Golf & Course Design is an extensive makeover of their earlier Jack Nicklaus' Greatest 18 Holes Of Golf. The game has been greatly improved and expanded upon to include course-design capabilities. The graphics are nicer, and draw much more quickly.

It still can take a while to "paint" an entire screen, but at least the image is saved in an off-screen bitmap. This eliminates delays when jumping to the overhead view and back. The interface is also a bit nicer and the product has a better overall feel to it.

Golf & Course Design features nearly all the elements common to a golf game: the power swing bar, a three-dimensional view from the golfer, a pre-tee-off overhead view of each hole, very good score keeping capabilities, and different levels of play.

One other advantage of Golf & Course Design is that it can use all the course disks from the original game. But once it uses a course disk, the original program can no longer read that disk, so be forewarned.

The included course designer is a nice added item. It is fairly easy to create interesting and challenging holes, and a built-in paint program lets you create beautiful backgrounds for the golfer's view of each hole.

Jack Nicklaus Presents the Major Championship Courses of 1990 is Accolade's new course disk, containing representations of the courses from Medinah, St. Andrews, and Shoal Creek. It is up to the standards of Accolade's other courses, and sound effects add to the enjoyment.

Golf & Course Design is a very solid golf game. The only unfortunate aspect is that the company does not, to my knowledge, have an upgrade path for purchasers of the previous version.

M1 TANK PLATOON

Microprose's latest is based on a hypothetical U.S.-Soviet Union conflict in Europe. M1 Tank Platoon puts the player in charge of four premiere U.S. battle tanks and any supporting forces assigned to them for each mission. As with many Microprose games, M1 Tank Platoon is built on a basic vehicle simulation engine. But the player can control the action at the strategic level; in fact, the whole game can be played without ever directly controlling a vehicle. The graphics are decent for a vehicle simulator. Two detail levels are available, allowing for a trade-off between detail and game speed. The lowest detail level is still adequate for play, and the game proceeds much quicker. The keyboard is used for most commands, augmented by both the mouse and a joystick, if desired. The keyboard overlay makes it fairly easy to learn the available functions while actually participating in the action. The manual is up to Microprose's usual high standards, aiding not only in mastery of the game, but also containing information about the equipment used in the battles, and effective tank tactics.

After each successful mission you are allowed to promote and decorate those crew members you wish to advance in the ranks. While this may sound purely ceremonial, each promotion or award advances the skill level of your crew members, helping them to perform even better in later battles. And while I generally don't like copy protection, the way it is handled in this game actually helps one during gameplay. Prior to your first "real" mission, you are shown a line drawing of a combat vehicle and must select its name from a list at the bottom of the screen. Gradual recognition of the silhouettes actually adds to the game experience, and frequent players will likely memorize all the silhouettes fairly quickly.



Dragonstrike

After dabbling a bit with the vehicle simulator portion, I did most of my playing on the strategic map, and focused on effectively maneuvering all units into place. The action often happens quickly but I can heartily recommend the M1 Tank Platoon just on the aspect of strategy. In fact, I would love to go back and use it as a format for learning even more about the weapons that could face each other on a battlefield.

DRAGONSTRIKE

From one unlikely war we go to another. Strategic Simulations, Inc. has just released Dragonstrike, their dragon flight simulator, for the Amiga. In the game you pilot a powerful dragon as you carry out several missions for the forces of good as they attempt to fight back the evil that has spread over most of their land. You begin as a lowly bronze dragon and work your



The Immortal

way up to a powerful gold dragon. As a knight, each successful mission opens up future possibilities and advancement within the three different levels of knights.

Dragonstrike uses filled polygon graphics and provides enough detail to keep the game interesting. The missions are well integrated, and gradually build up the player's skills. The dragons do tend to respond too quickly to controls; it can be very hard to fly an even path, and it is extremely difficult to effectively maneuver a dragon in close combat. It is nice that the player is not deleted when he loses a mission. Instead, he can repeatedly attempt a mission until it is mastered.

While the game design is fairly good, Dragonstrike will probably appeal only to a limited range of people. But if you have always wanted to fly a dragon, this is likely the closest you will come.

THE IMMORTAL

The Immortal is a new role-playing game from Electronic Arts. The plot is rather typical: a powerful good wizard has been trapped by the forces of evil, and it is up to you to work your way down to the deepest part of a dungeon to free him. As with many of the recent role-playing releases, The Immortal uses an overhead three-dimensional perspective for movement. While this provides a good view of the area around your character, control of your movement can be a bit confusing.

Once you get close enough to an opponent, you enter into close combat. This is carried out on the same screen but your only options are to strike with your sword, stand still, or dodge out of the way of your opponent's attack. The battle continues until one of you is killed.

Various rooms populate the dungeon. Some are straightforward, such as hallways. Others are loaded with traps and require careful strategy to navigate. The manual, though not extensive, does include some special information about some of the rooms, and you will need this to make it through them without losing your life. The graphics are sharp and the sound adequate. Still, the controls are slightly difficult to handle. •AC•

This edition of "Snapshot" marks the close of games coverage by R. Bradley Andrews and the Snapshot column. Not to fear, though—we'll return next month with complete coverage of the latest in Amiga strategy, simulation, and adventure.—Ed.

Product Information

Shadow of the Beast II
Price: \$59.99
Psygnosis Limited
29 St. Mary's Court
Brookline, MA 02146
(617) 731-3553
Inquiry #208

The Killing Game Show
Price: \$44.99
Psygnosis Limited
29 St. Mary's Court
Brookline, MA 02146
(617) 731-3553
Inquiry #209

Where In Time Is Carmen Sandiego?
Price: \$49.95
Broderbund Software Inc.
17 Paul Drive
San Rafael, CA 94903
(800) 527-6263
Inquiry #212

Jack Nicklaus' Unlimited Golf &
Course Design
Price: \$59.95
Accolade
550 S. Winchester Blvd., Ste. 200
San Jose, CA 95128
(408) 985-1700
Inquiry #214

Jack Nicklaus Presents the Major
Championship Courses of 1990
Price: \$19.95
Accolade
550 S. Winchester Blvd., Ste. 200
San Jose, CA 95128
(408) 985-1700
Inquiry #215

M1 Tank Platoon
Price: \$69.95
MicroProse Software, Inc.
180 Lakefront Drive
Hunt Valley, MD
(301) 771-1151
Inquiry #210

Dragonstrike
Price: \$49.95
SSI/dist. by Electronic Arts
1820 Gateway Drive
San Mateo, CA 94404
(800) 245-4525
Inquiry #211

The Immortal
Price: \$49.95
Electronic Arts
1820 Gateway Drive
San Mateo, CA 94404
(800) 245-4525
Inquiry #213

AMIGA WORLD EXPO PRESENTS

★ BOSTON, MA ★
January 4-5

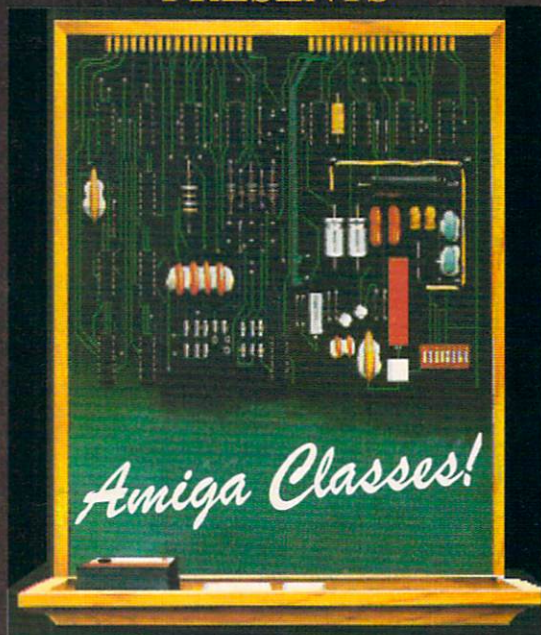
★ SEATTLE, WA ★
January 11-12

★ RALEIGH, NC ★
January 18-19

★ SAN DIEGO, CA ★
January 25-26

★ DETROIT, MI ★
February 8-9

★ TORONTO, ON ★
February 22-23



WINTER SEMESTER
1991

★
NOVICE CLASSES

★ YOUR FIRST AMIGA ★

★ USING THE CLI ★

★
MASTER CLASSES

★ AMIGA ANIMATION ★

★ AMIGA GRAPHICS ★

★ AMIGA VIDEO ★

AMIGA NOVICE CLASSES - THE PERFECT INTRODUCTION

AmigaWorld Expo offers Novice classes for Amiga users just starting out. Both classes are designed to give you basic introductory information. Each class is 3 hours, costs \$30 a person and is limited to 40 students.

AMIGA MASTER CLASSES - GET THE MOST FROM YOUR AMIGA!

Amiga Master Classes are designed to provide in-depth information on several professional topics of Amiga use. Each subject is offered in the morning in an introductory format and in the afternoon for more advanced users. We encourage you to attend both. Each 3 hour class costs \$60.00 a person and is limited to 40 students.

AMIGA CLASS INSTRUCTORS - YOUR KEY TO SUCCESS

The quickest way to master your Amiga is to learn from a Master. Our instructors include Amiga luminaries such as: STEVE SEGAL, ORAN J. SANDS III, BRADLEY SCHENCK and GENE BRAWN.

REGISTER TODAY! CALL 800-32-AMIGA or 914-741-6500

NOVICE CLASSES

Basic Amiga Concepts

NOVICE I is an total introduction for the Amiga user, covering the Amiga software and hardware configurations. Expanding your Amiga with memory, hard drives, printers, modems and other peripherals is discussed.

Understanding the CLI

NOVICE II gives the Command Line Interface (CLI) an in-depth look. Your Amiga is at its most flexible when you understand use of the CLI. A special look at the world of Amiga public domain software will also be included.

MASTER CLASSES

The Amiga Animation Station

ANIMATION I will cover the basics of animation in general and Amiga animation specifically. Different animation options will be discussed with an emphasis on two dimensional animation. ANIMATION II is a continuation of Animation I and delves more specifically into artist's technique. Three dimensional animation is the primary topic for this course.

INSTRUCTOR: STEVE SEGAL

Working with Amiga Graphics

GRAPHICS I covers all aspects of the current state of the Amiga art of illustration. The advantages and disadvantages of different Amiga resolutions will also be covered. GRAPHICS II will cover specific techniques on computer illustration. These topics include palettes, anti-aliasing, landscapes, and color-cycling.

INSTRUCTOR: BRADLEY SCHENCK

The Amiga as a Pro Video Tool

VIDEO I covers basic technical video concepts that concern Amiga users. Amiga graphic techniques for video and informal questions and answer sections form the basis for this class. VIDEO II is a continuation of Video I. This class will take an effect-oriented approach, demonstrating the usage and combination of various Amiga programs.

INSTRUCTOR: ORAN J. SANDS III or
GENE BRAWN

WHO'S ZOOMING WHO?

Attaching a zoom box to an Intuition window

by John Leonard

A ZOOM BOX IS A GADGET THAT sits in an Intuition window just above the window-sizing gadget in the lower right-hand corner. When the user selects the zoom box with the mouse, the window to which it is attached zooms out to its maximum size in the center of the screen. When the zoom box is deselected, the window zooms back to its previous size and position, which has been determined by the user. If the window is either resized or moved when it is zoomed out, the zoom box will be automatically deselected and its imagery redrawn. The program included in this article attaches a zoom box to an Intuition window and allows the user to toggle the window's size and its position by clicking in the zoom box.

In addition to demonstrating the zoom box, the program prints the text of a file specified on the command line in the zoom box window, with tabs replaced by spaces. Double clicking the left mouse button scrolls the text up one page, where a page is the number of lines that will currently fit in the window.

The program is invoked from the CLI with the command format:

```
ZoomBox pathname spaces
```

where "pathname" is the name of an ASCII text file and "spaces" is the number of spaces that will be used to replace each tab of the textfile before it is printed.

The idea for the zoom box comes from the Macintosh. In general, Macintosh windows have a zoom box in their upper right-hand corners. This is in contrast with Amiga windows which have window-depth gadgets in their upper right corners. Macintosh windows don't have window-depth gadgets. They are automatically moved to the front when selected.

The Zoom Box gadget for the Amiga was designed in a two-step process. First, the imagery of the gadget was created in DeluxePaint II. The imagery of the gadget consists of two aspects: the way the gadget will appear when the window is at its

normal size, and, second, the way the gadget will appear when it is used to zoom the window out to its maximum size. Intuition calls the first, or normal imagery of the gadget its "render" image, meaning that that is how the image will be rendered. Intuition calls the second type of imagery the "select" image, meaning that that is how the gadget will appear when it is selected, or chosen, by the user. After both of these images have been created and stored as brushes in DPaint, they are loaded into Power Windows 2.0 to create the rest of the data structures that are needed to finally implement the gadget in a program.

PROGRAMMING IN INTUITION

It is a programmer's job to let Intuition know what kind of windows, menus, and gadgets they want to use in their interface. Everything necessary to completely describe these objects must be provided to Intuition by the programmer. Each window must belong to a specific screen, and in a specific location. It must have a maximum and minimum size. It must have its pen colors chosen so that text and backgrounds may be rendered. Gadgets will have imagery specified for them so that Intuition may draw them correctly. Menus and menu items must be dimensioned so that Intuition knows where on the screen to draw them and

how much space to provide for them. The list of things that Intuition must know in order to put together even a simple display goes on and on.

What is the process by which Intuition learns about the desired qualities of the windows and other objects that the programmer wants to use in their program? Let's look at one case, that of a gadget. What does Intuition need to know in order to create and manipulate an application gadget? Well, it needs to know which window the gadget will appear in; how far from the left edge of the window the left edge of the gadget itself will begin; how far from the top edge of the window the top edge of the gadget will begin; how large the gadget is, horizontally and vertically; what type of gadget this will be (Intuition currently provides three basic types of gadgets). Intuition also needs to know how to obtain the imagery for the gadget, and there are a whole host of specifications, called flags, indicating just exactly how the gadget is to behave when it is manipulated by the user. How is all of this information conveyed to Intuition in a form that is efficient and practical? By use of a structure.

STRUCTURES

If you are already familiar with structures and pointers then skip this section. The term "structure" is vague and if you don't know what it means, you won't guess by looking at it. Let me explain its meaning with an analogy. Suppose you go for a job interview. You will be presented with a "Job Application Form". This is a sheet of paper with spaces (fields) provided for you to enter information about yourself. There is a space for you to enter your name, another for your address, and so on. Everyone who applies for the job gets the same form. However the information they provide depends on their own particulars. Now let's suppose

We take a **byte** out of the price!



ONE BYTE

P.O. Box 455
Quaker Hill, CT 06375
(800) 441-BYTE, In CT (203) 443-4623

YOUR ONE-STOP AMIGA STORE

**Authorized dealer for
Commodore-Amiga Computers,
Great Valley Products (GVP),
Authorized Commodore-Amiga Service and Repair.
Authorized Amiga Graphics Dealer.**

AMIGA IS A REGISTERED TRADEMARK OF COMMODORE-AMIGA, INC.

Circle 121 on Reader Service card.

that instead of applying for a job, you apply for auto insurance. Again, you will be presented with a form to fill in with information about yourself. This time, however, the form will request different information. In both cases you are asked to complete a form, but the information required by the forms, and the ways in which it is arranged, are different. These examples, and the many others with which we are familiar, allow us to create the notion of a "form", which is a sheet of paper that has been divided into different blocks or areas, the contents of which are to be filled in, and later interpreted, in specific ways depending on the type of form in question.

Now let's suppose that the people at the insurance company want to computerize their operation. First, applicants will provide information about themselves on the paper form, then the information will be entered to a computer by data entry personnel. The way in which information about a specific applicant will be stored in the computer is analogous to the way in which it was stored on paper. A block of memory (the paper), of sufficient size, will be reserved to store the information about one person. Each piece of information (name, address, age, etc.) will be stored in a different place in that memory. Suppose we decide that it will take 100 bytes to store the information we need for each individual. We might break it down as follows: bytes 0 - 39 (the first thru fortieth memory locations) will be used to store the name, one character at a time. Bytes 40 - 79 (the forty-first thru eightieth memory locations) will hold the person's profession, again one

character per memory location. The remaining twenty bytes (80 - 99) will be divided up in some way that we see fit so they may store what remains of the information we want to record. Now, all memory locations in the computer are numbered, from 0 to whatever is the highest memory location, and if we are told that the record (structure) of a given person is stored in the computer at, say, location 1000, then we can find any piece of information in that record simply by going to location 1000 and counting up the required number of spaces until we reach the correct location. Each different piece of information in a structure, (name, address, etc.) is called a "field".

Here is an example of how a Structure is defined in a C program:

```
struct point{
    SHORT    x, y;
};
```

These three lines tell the compiler that we are going to define a new type of structure called "point". This structure is widely used in graphics systems. Both Intuition and Macintosh's QuickDraw define this object. This structure will have two fields: a field called "x", and a field called "y". Both of these fields will be of type SHORT. That is, they will both be 16 bit (two byte) signed integers. The entire structure will take up four bytes in memory. Field x will begin at the beginning of the structure itself, and field y will begin two bytes later. All that we have done is define the data type "point". We haven't reserved memory for any point structures yet. Now let's do so:

```
struct    point    aPoint, *aPointPointer;
```

This line tells the compiler to set aside enough memory for the following data items: a structure of type point that will henceforth be referred to by the name "aPoint", and another variable that will go by the name of "aPointPointer" that will take as its value the machine addresses of point structures. A variable that takes as its value the address of other variables is said to be a "pointer". The following code assigns the address of "aPoint" to the variable "aPointPointer":

```
aPointPointer = &aPoint; /* '&' is the address operator */
```

INTUITION STRUCTURES

In essence, a program communicates with Intuition via structures. In order to open a window, a program must first pass a pointer to a NewWindow structure (a structure that contains the information about where the window is to be placed, how large it is, etc.). This structure is passed to Intuition by calling the Intuition function OpenWindow() as follows:

```
struct    Window        *aWindowPointer;        /* 1 */
struct    NewWindow      aNewWindowStructure;    /* 2 */

/* The structure "aNewWindowStructure"          */
/* will be initialized here.                      */

aWindowPointer = OpenWindow(&aNewWindowStructure); /* 3 */
```

Line 1 is a declaration. It tells the compiler that we will be using a variable called "aWindowPointer" and that, starting from the

asterisk and reading from left to right, this variable is a "pointer" (*) to a "structure" (struct) of type "Window". This variable will be used to hold on to the address of a Window Structure when we get it back from Intuition after the call to OpenWindow().

Line 2 declares a structure of type NewWindow called, oddly enough, aNewWindowStructure. Line 3 is a function call. It calls the Intuition function "OpenWindow", passes the address of the NewWindow structure and receives, in return, the address of a Window Structure which is assigned to the variable "aWindowPointer".

THE EVENT LOOP

The Amiga (and Macintosh, and Sun, and...) type of programming is called "event-driven programming". The basic idea is: Get your program into memory, start running it, initialize everything that you need to initialize, draw all of the windows and what not that you need to draw, enter the Event Loop, and wait. Wait until the user does something. Like click the mouse, select a menu, insert a disk, what have you. When they do, the system (in this case, Intuition) will notify the application of what has happened. The application will receive the message, interpret it, and take the appropriate course of action given the nature of the event. When the application is finished processing this event, it will return to the Event Loop and wait for the next event.

At the start of each iteration of the event loop the application must wait for an event. Before the loop is first entered, the application creates a Message Port through which it will communicate with Intuition. A Message Port is a structure that has been designed to facilitate its use as a destination point for the reception of Messages, which are also structures.

When a window is opened, the address of a NewWindow structure is passed to Intuition. One of the fields of the NewWindow structure is called IFLAGS or Intuition flags. This field is a 32-bit (or four-byte) long quantity. Each bit in this field has a specific meaning. Since each bit can be either a one or a zero, it can have two possible states. These bits, or flags, each represent a different type of event that Intuition is capable of sending to our application. By setting a given bit to the value one, we are telling Intuition that we want it to send us information about the corresponding type of event when it occurs. If a given bit is reset—that is, made equal to zero—we let Intuition know that we do not want to hear about the corresponding event should it occur.

The point is that, if we set any of these flags at all, Intuition will see that we are interested in receiving at least some types of messages and therefore we will need to have a provision for receiving them. In this case, Intuition will create a message port for us and, when a user-generated event occurs that concerns our application, Intuition will send a message regarding that event to our message port. After Intuition creates a message port for our application it will set the UserPort field of the Window structure that is returned by OpenWindow to point to the address of the message port. There are various ways to get a message from this port. The one that we will use is:

```
intMessage = (struct IntuiMessage *)
             GetMsg((struct MsgPort *)gWindow->UserPort);
```

Here "intMessage" is a pointer to an IntuiMessage, which is the kind of message used by Intuition. GetMsg() is an Exec

BRIDGEBOARD USERS!

Don't waste money, slots, or desk space buying extra IBM-compatible or Amiga floppy drives! The **Bridge Drive Commander +** gives you direct access to all your internal and external Amiga drives from the Bridgeboard, and direct access to IBM type 360K and 720K drives from AmigaDOS. **Bridge Drive Commander +** is totally transparent and automatic. Put an IBM type disk in any drive and use it just like on any IBM compatible! Put in an Amiga disk and return to Amiga use! Just that simple, just that fast! One drive can use Amiga disks at the same time another is using IBM-compatible disks. Disks are completely usable by other Amiga and IBM-compatible computers. All hardware, no software drivers to load, no precious memory or expansion slots used up. Plugs onto motherboard at internal drive connector. (No soldering or wiring changes.) Compatible with all Bridgeboards (8088, 80286), SideCar, all accelerator boards (any 680x0), hard disks and other hardware and software.

Bridge Drive Commander + \$ 97.50

MJ SYSTEMS

Dept 10A, 1222 Brookwood Road, Madison, WI 53711

1-800-448-4564

(24 hours MasterCard/VISA)

Product names are trademarks of their respective companies.

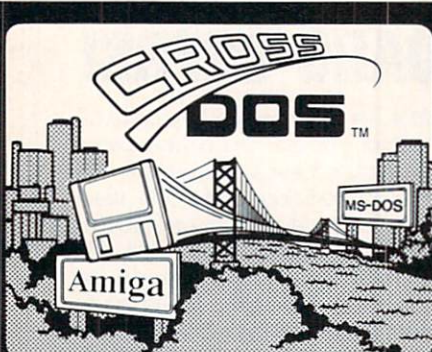
Circle 149 on Reader Service card.

function that gets the next message from the message list of the given message port. Here it takes the address of our window's message port. The value it returns is cast as pointer to a structure of type IntuiMessage.

When the call to GetMsg() is made in the code above, GetMsg() will return immediately, whether or not there is a message in the queue. If there is none, GetMsg() will return a value of zero. In that case the program will go to sleep and wait for a message to arrive. It accomplishes this by calling the function WaitPort() as in the following code fragment:

```
if(!intMessage)
    WaitPort((struct MsgPort *)gWindow->UserPort);
```

When WaitPort() is called the program will become inactive until a message arrives at this port. At that point, the program will resume execution at the line following the call to WaitPort(). In our case, this will take it past the block following the "else" statement, down to the end of the main loop where, because it is a loop, control will be passed back up to the statement at the top of the loop, which is GetMsg(). To sum up, the main loop works this way: first, we enter the loop. Next, we see if there is a message waiting at our message port. If there is, we process it inside of the "else" block and then go back to the top of the loop to see if there is another. If there isn't we go to sleep until there is, and then go back to the top of the loop in order to get it.



CROSSDOS™

...MS-DOS®

DISK ACCESS DONE RIGHT!

Version 4

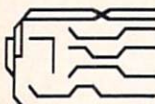
Suggested Retail:
\$39.95 (US)

The first MS-DOS File System for the AMIGA®

- Reads or writes any 360K or 720K MS-DOS or ATARI ST® disks (Version 2.0 or higher) with standard Amiga-connected floppy drives.
- Transparently accesses MS-DOS files from any utility or application (including file requesters) because it fully integrates into the Amiga operating system (AmigaDOS Versions 1.2, 1.3 and now 2.0).
- Provides an easy installation program.
- Format, diskcopy and check the integrity of an MS-DOS disk.

Version 4 Enhancements

- Up to 2 times faster floppy data access on an Amiga 500, 1000, or 2000. Format a 720K MS-DOS disk (with verify) in 149 seconds!
- Evening and weekend BBS available for update information and to trade uploads for file conversion programs. BBS# (313) 459-7271 -- 6pm to 10am EST weekdays, all day weekends.



CONSULTRON

11260 Parkview Technical Support
Plymouth, MI 48170 (313) 459-7271

Reviewed in many popular Amiga Magazines:

"... CrossDOS is unquestionably the best utility I have seen for reading from and writing to 3.5-inch MS-DOS disks on the Amiga."
Tim Walsh
AmigaWorld

"It [CrossDOS] works so unobtrusively that I don't even notice it anymore."
Donald Maxwell
A.X. Magazine

"... now I send files back and forth to and from IBM land in a totally transparent fashion."
Jim Locker
Amazing Computing

Amiga is a registered trademark of Commodore-Amiga, Inc. MS-DOS is a registered trademark of Microsoft, Inc. Atari ST is a registered trademark of Atari, Corp.

Circle 117 on Reader Service card.

CONTROLLING THE ZOOM BOX

The purpose of the Zoom Box is to allow the user to toggle the window between two different states: the zoomed state, which is set by the programmer, and another, which is set by the user with the mouse. In order to do this we'll have to store the last size and position of the window before we zoom it. We'll have to know when to zoom it, and if the user zooms the window and then changes its size or position with the mouse, we'll have to reset the zoom box's state to indicate that the window is no longer zoomed out.

The last size of the window will be stored in two global variables called gWidth, and gHeight. A global variable is one that is declared in the same file as the one that contains the function main(), but before main() itself is defined. A global variable can be accessed by any function in the program although, if it is to be accessed by a function defined in another file, it will have to be redeclared in that file as type extern, or external (to that file). In this program, all global variables begin with the letter 'g'. The last position of the window will be stored in the variables gLeftEdge, and gTopEdge. When the user selects the Zoom Box, we will first copy the values relating to the current size and position of the window to their respective storage locations. Then, we will move the window to its zoomed location at the upper left corner of the screen. Finally, we will size the window to its maximum size.

The window must first be moved, and then sized, because to enlarge the window to its maximum size while it is located near the center of the screen would cause a portion of the window to appear off screen. That is a no-no. As far as Intuition is concerned, no window may exist outside of the screen boundaries.

How will we know when the user has zoomed the window? When the user selects the Zoom Box, they will do so by clicking in it with the mouse. They will depress the left mouse button once, and then release it while the pointer is still within the gadget's imagery. Intuition defines this type of user-generated event as a GADGETUP event. In order to receive this type of event, we will have to set the flag corresponding to it in our NewWindow structure before calling OpenWindow().

See the definition of MAIN_WINDOW_IFLAGS in the file ZoomBox.h. These are the IDCMP flags that will determine what kind of messages our window will be able to receive. They are different than MAIN_WINDOW_FLAGS which specify the type of window that we will receive. This is another case of the complexity of Intuition's programmer interface. It can be confusing, at first, remembering just exactly which flags belong to which variable. This is reminiscent of the Gadget structure which has three separate flag variables, again requiring that you know exactly which type of flag goes in which field.

When we receive the GADGETUP event for this window, we first test it for the zoomed state by use of the code fragment:

```
if(gZoomBox.Flags & SELECTED)
```

No, the "&" character in this line does not have anything to do with taking the address of something. I apologize for the bewildering nature of the C language. In this context "&" is a boolean operator that "ands" the values of the Flags field of gZoomBox with the value represented by predefined string "SELECTED".

If the flag bit corresponding to the selected state is set then the expression within the parentheses will evaluate to a non-zero value and the statement or block of statements following the "if" will be executed.

After the window has been zoomed out, the user may move it again, or they may resize it. If the window is no longer in the upper left corner of the screen, at its max size, then the zoom box gadget's state must be changed to reflect this. When the user changes the size of the window, we will receive a NEWSIZE event. When they move the window, we will receive a REFRESHWINDOW event. The course of action taken in both situations is almost identical, we will merely be testing for different things. In the case of a NEWSIZE event, we will want to know if the gadget is selected at the same time that the window has something other than its maximum size. In the case of a REFRESHWINDOW event, we will want to know if the window is both selected and has a position other than the one at the upper-left corner of the screen. In both cases, if the conditions are met, we remove the gadget from the window gadget list, change the gadget's Flags field by resetting (turning off) the SELECTED flag, place the gadget back on the list, and force Intuition to redraw the gadget by calling RefreshGList().

The gadget is removed from the gadget list before being modified, quite simply, because that is what the Rom Kernel Reference Manual says you should do.

The Flags field of the gadget is reset by "and" ing it with ~SELECTED. In this way, none of the flags in the Flags field of the gadget will be disturbed except the SELECTED flag, which will be reset (turned off).

Trumpcard 500 ...

The Only A500 Expansion System That Offers Free Hardware Upgrades for the A2000 and A3000!

Trumpcard 500 expansion cards are the same cards sold by IVS for the A2000 and the A3000. The ultra reliable *Trumpcard* SCSI disk controller, *Trumpcard Professional*, the ultimate high performance SCSI disk controller, and *Meta4*, a 512k - 4M fast RAM expansion card, all work flawlessly in the Trumpcard 500 expansion chassis. So when you upgrade to an A2000, 2500, or 3000, just pull the cards from the Trumpcard 500 chassis and plug them into the new computer. No problems, no sweat, no charge. It's that simple.

- Trumpcard 500 can house a Trumpcard or Trumpcard Professional SCSI disk controller, Meta4 RAM board, and a 3.5" SCSI hard disk drive.
- Totally flexible, Trumpcard 500 allows you to add up to 4Mbytes of fast RAM first then add SCSI drive and Trumpcard controller later. Or add hard drive and controller first, then add up to 4Mbytes fast RAM later.



- Meta4 and Meta4/500 provide 16 bit, 0 wait state, low power fast RAM. Meta4 is available populated or 0k and is expandable in increments of 512k, 1M, 2M, or 4Mbytes using 256k x 8 or 1M x 8 SIMM memory modules.
- Trumpcard 500 autoboots into FFS and includes full support of removable media drives at no extra cost.

HOLIDAY SPECIAL!
Trumpcard 500 & Meta4 0k
Bundle \$399.95



INTERACTIVE VIDEO SYSTEMS

7245 Garden Grove Blvd., Suite E • Garden Grove, CA 92641 • Phone: (714) 890-7040 • Fax: (714) 898-0858

HOW RETAB WORKS

In addition to demonstrating the zoom box, the program also prints the text of a file, chosen by the user, in the window. The text is retab'd to a number of spaces that is also chosen by the user. The text printing feature of the program is included to demonstrate the way in which an actual program using a zoom box might be written.

The reason that the program retabs the file before printing it is not what you might suppose. It was not originally included as a convenience. In fact, the file is being retab'd because I use the Graphics Library function Text() to print the text to the window, and this function does not perform formatting. It does not know how to interpret tabs, or other format characters, so I had to come up with a way to replace them with printing characters. "Retab" is a program I had written for the IBM PC. The laserjet print utility on the school network prints 8 spaces per tab, and my files were usually set up for less than that, so I wrote a utility that replaced the tabs in a text file with the number of spaces indicated on the command line. It was a simple matter to adapt this program for use in the zoom box demo.

When the program begins, if the number of arguments on the command line is equal to three, including the program name itself, the second argument is taken as the name of a text file to be printed in the window. The third argument is taken as a string representation of an integer quantity which is to be used as the number of spaces. LoadAndRetabFile() is executed with the filename and number of spaces as input. It also receives an integer address (int *filesize) and a character pointer address (char **filetop). The pointer, filesize, will be used to store the amount of memory that is actually reserved. The pointer to a character pointer (there is no reason why a variable cannot take as its value the address of another variable whose value is also the address of yet another variable), filetop, will be used to point to the address at the end of the actual retab'd file.

All right, let me explain that. Retab works in this way: first, find out how large the file we are going to load and print is. Next, since we are going to replace the tabs in that file with spaces, the resulting retab'd file is going to be larger than the original by some amount. That means that, in order to store the retab'd file, we will have to reserve more memory than is actually needed to store the original file itself. The question is: How much more space will we need to reserve for the retab'd file? There are many answers to this question. I chose the easiest for me to program in a short amount of time. Here it is: Take the size of the file that we are going to open. Multiply by some amount, MULTIPLIER. Call the result "filesize". Reserve that much memory. Load the file in, a little at a time, and retab it to the memory we have allocated. If we find that we have run out of memory before the entire file is loaded and retab'd, stop. That's it, just stop. This is only a demonstration program and we don't have to be able to account for every possibility. We should be able to fit most files into the memory we have allocated. Any files that don't fit either have an awful lot of tabs, or the user has specified a lot of spaces per tab, or both. If we find that the entire file has been loaded and retab'd before we run out of memory, save the address of the next memory location we would have written to and call this pointer "filetop".

Now, LoadAndRetabFile() is a function. "filesize" and "filetop" will be stored in the global variables gFileSize and gFileTop, but we don't want the function to actually refer to them by these names. This is because we may want to use this function again, with different variables holding the results, and we may

List Of Advertisers

Please use a Reader Service card to contact those advertisers who have sparked your interest. Advertisers want to hear from you. This is the best way they have of determining the Amiga community's interests and needs. Take a moment now to contact the companies with products you want to learn more about. And, if you decide to contact an advertiser directly, please tell them you saw their advertisement in

Amazing / **AMIGA**
COMPUTING
Your Original AMIGA Monthly Resource

Advertiser	Page	Reader Service Number
AmigaWorld Expo	74	165
Benetech	38	106
Consultron	78	117
Delphi Noetic Systems, Inc.	13	110
Delta Graphics	29	118
Designing Minds	2	113
Digital Creations	CIV	163
DKB Software	45	159
Grapevine Group Inc., The	83	147
Grass Roots Video Productions	28	112
Great Valley Products, Inc.	7	123
GT Devices	44	116
Hunter Group, The	81	111
ICD	CIII	108
Interactive MicroSystems Inc.	12	109
Interactive Video Systems	79	114
Interactive Video Systems	63	140
Meggido Enterprises	28	144
Memory Location, The	85	107
Memory Management Inc.	29	186
Michaelangelo Productions	30	127
MJ Systems	77	149
One Byte	76	121
Parth Galen	29	115
Ramco Computer Supplies	28	120
SAS Institute	66	126
Software House	46	154
Supra Corporation	9	119
TeleGraphics International	68	156
TTR Development, Inc.	25	164
VIDTECH	87	122

**SMASH HIT
RETURN ENGAGEMENT**

THE SECOND ANNUAL
**WORLD OF
AMIGA**
IN NEW YORK CITY

★ STARRING ★
THE AMAZING AMIGA

★ FEATURING ★
**AMIGA HARDWARE • AMIGA SOFTWARE
AMIGA ACCESSORIES • SEMINARS • BARGAINS**

Pier 90, New York Passenger Ship Terminal, New York NY

APRIL 5-7, 1991

Friday, Saturday & Sunday, 10 am - 5 pm

PRE-REGISTRATION (Deadline March 15):

\$10 per single day, \$25 for all 3 days

REGISTRATION AT THE SHOW:

\$15 per single day, \$30 for all 3 days

Admission includes exhibits and seminars.

World of Amiga in New York City is restricted to persons 12 years of age and older.



**WORLD OF
AMIGA**
IN NEW YORK CITY

Produced by The Hunter Group. For more information call (416) 595-5906 or fax (416) 595-5093.

SAVE WITH PRE-REGISTRATION
World of Amiga in New York City, April 5-7, 1991

Please register me for World of Amiga at the Special Pre-registration Rate
☐ \$10 for a single day ☐ \$20 for 2 days ☐ \$25 for all 3 days

NAME _____

COMPANY (if applicable) _____

ADDRESS _____

STATE _____

ZIP _____

CITY _____

Make Check or Money Order payable to
The Hunter Group, 3380 Sheridan Drive, Suite 120, Amherst, NY 14226

not want them to be globals. The function LoadAndRetabFile() will receive, from the environment that calls it, the addresses into which the calling environment wants the function to store the values of "filesize" and "filetop".

That is to say, it will supply the address of an integer quantity (int *filesize) and a pointer to a pointer to type char (char **filetop). When LoadAndRetabFile() has determined the amount of memory that will be reserved it will store that amount in the address pointed to by filesize (*filesize = amount). When the function has determined the actual top of the file that has been filled it will store that result in the location pointed to by filetop (*filetop = actualEnd).

We need to know the exact amount of memory that has been reserved by LoadAndRetabFile() because we will need to deallocate it at the end of the program. Having a pointer to the actual end of the file will simply make it easier for us to cycle through the file when we print it out.

PRINTING THE TEXT

The functions, FindNewLnrPtr() and DrawWindow() together determine the starting line, in the text, at which printing is to take place, and print as many lines of the text as will fit in the window.

The purpose of FindNewLnrPtr() is to determine the starting location in the file at which the text will begin if it is moved up one page. This will happen when the user double clicks the left mouse button. FindNewLnrPtr() works by subtracting the heights of the top and bottom borders from the height of the window and then dividing the result by a predefined quantity, PIX_PER_LINE and then subtracting 1. The value of PIX_PER_LINE, which is 8, was arrived at purely by guesswork. I would have liked to have had a function that could provide me with the height of the text in the current window or RastPort, but the Graphics Library provides no such function.

DrawWindow() first clears the window by calling the Graphics function RectFill() and passing the rectangle corresponding to the window, minus its borders as a parameter. The function then determines the number of lines it has to print in the window as well as the length of the longest line that can be printed in the window. Then it initializes the pen locations to the upper-left corner of the window but translated vertically downward to account for the height of the text. DrawWindow() then starts at the beginning of each line and goes until it finds a carriage return ("r"), a newline ("n"), or it has gone as far as the maximum line length will allow. It then prints the line at the current pen location. The function then looks for the start of the next line and, when it finds it, the function repeats the process until either all of the lines that will fit into the window have been printed or it has gone past the top of the text file.

When the user selects CLOSEWINDOW, HandleEvent() sets gDone to the value TRUE. When HandleEvent() returns to the main loop, the loop test fails, and the loop is exited. The function CleanUp() is then executed, and this closes or deallocates all of the resources the program has used.

To compile the program, the command line to use, for Lattice C, is:

```
lc ZoomBoxMain ZoomBoxFunctions
```

To link, make sure the object files and the with file, ZoomBoxwith, are in the current directory and type:

```
Blink with ZoomBoxwith
```

LISTING ONE: ZoomBoxMain.c

```
/* File: ZoomBoxMain.c */

/* These are the 'include' files. They are
/* included at the beginning of the program so
/* that the compiler may refer to them during
/* the compilation process. Among other things
/* they contain the structure definitions of
/* Windows, IntuiMessages, and Gadgets. They
/* also contain the definitions of structures
/* used by Exec, such as Node, and Message.
/* These definitions were created by Commodore. */

#include "exec/types.h"
#include "exec/memory.h"
#include "intuition/intuition.h"
#include "stdio.h"
#include "libraries/dos.h"
#include "libraries/dosextens.h"

/* 'ZoomBox.h' contains the definitions that
/* will be used in this program specifically.
/* They were created by me. */

#include "ZoomBox.h"

/* In order to call functions in the Intuition
/* or Graphics libraries, the compiler must know
/* where those libraries are located. Their
/* addresses will be obtained by calls to the
/* function OpenLibrary() and will be stored in
/* the appropriate variable. When an Intuition
/* function is called within the program, the
/* compiler will refer to the variable
/* IntuitionBase to determine the location in
/* the machine at which the Intuition Library
/* begins.

extern long IntuitionBase = NULL;
extern long GfxBase = NULL;

/* These are the Global variables that will be
/* used by the program. They are global because
/* they are being declared in the file of the
/* program that contains main(), and they are
/* being declared before main() itself is
/* defined. All globals start with a small 'g'
/* to signify the fact that they are global.
/* Global variables have the disadvantage that
/* they can be accessed from within any function
/* of the program, which can make it difficult
/* to debug a program if globals are being
/* modified at many points. They have the
/* advantage that they simplify the mechanism of
/* passing information to functions. For a small
/* program like this they will not present any
/* great problems.

struct Window *gWindow = NULL;
UBYTE gDone = FALSE;
ULONG gClass,
gLSecs,
gLMics,
gCurSecs,
gCurMics;
SHORT gLeftEdge,
gTopEdge,
gWidth,
gHeight,
gCharLength;
USHORT gCode;
char gBfrr[BUFSIZE],
*gFilePtr = NULL,
*gFileTop = NULL,
*gLinePtr = NULL,
*gTestString = "AT";
int gFileSize = NULL;

/* Zoom Box Gadget definition
USHORT CHIP ImageData1[] = {
0xFFFE, 0xC006, 0xDFF6, 0xDFF6,
0xDE06, 0xDE06, 0xC006, 0xFFFE,
0x0000, 0x0000, 0x0000, 0x0000,
0x01F8, 0x01F8, 0x01F8, 0x0000
};

struct Image Image1 = {
0, 0,
15, 8,
2,
ImageData1,
0x0003, 0x0000,
NULL
};

USHORT CHIP ImageData2[] = {
0xFFFE, 0x8006, 0xBFF6, 0xBFF6,
0xBFF6, 0xBFF6, 0x8006, 0xFFFE,
0x0000, 0x7FF8, 0x7FF8, 0x7FF8,
0x7FF8, 0x7FF8, 0x7FF8, 0x0000
};

struct Image Image2 = {
0, 0,
15, 8,
2,
ImageData2,
0x0003, 0x0000,
NULL
};

struct Gadget gZoomGadget = {
NULL,
```



```

-15,-16,
15,8,
GADGIMAGE+GADGIMAGE+GRELBOTTOM+GRELRIGHT,
RELVERIFY+TOGGLESELECT,
BOOLGADGET,
(APTR) &Image1,
(APTR) &Image2,
NULL,
NULL,
NULL,
NULL,
NULL,
NULL,
};

void main(argc, argv)
int argc;
char *argv[];
{
    struct NewWindow aNewWindow;
    register struct IntuiMessage *intMessage;

    /* Here is where the New Window structure is
    /* initialized before it is passed to
    /* OpenWindow().
    /*
    aNewWindow.LeftEdge = 40;
    aNewWindow.TopEdge = 30;
    aNewWindow.Width = WINDOW_WIDTH;
    aNewWindow.Height = WINDOW_HEIGHT;
    aNewWindow.DetailPen = 0x00;
    aNewWindow.BlockPen = 0x01;
    aNewWindow.IDCMPFlags = MAIN_WINDOW_FLAGS;
    aNewWindow.Flags = MAIN_WINDOW_FLAGS;
    aNewWindow.FirstGadget = (struct Gadget *)&gZoomGadget;
    aNewWindow.CheckMark = NULL;
    aNewWindow.Title = "Zoom Box Window";
    aNewWindow.Screen = NULL;
    aNewWindow.BitMap = NULL;
    aNewWindow.MinWidth = WINDOW_MIN_WIDTH;
    aNewWindow.MinHeight = WINDOW_MIN_HEIGHT;
    aNewWindow.MaxWidth = WINDOW_MAX_WIDTH;
    aNewWindow.MaxHeight = WINDOW_MAX_HEIGHT;
    aNewWindow.Type = WBENCHSCREEN;

    /* Now we open the Intuition and Graphics
    /* Libraries.
    /*
    IntuitionBase
    = OpenLibrary("intuition.library", INTUITION_REV);
    if(IntuitionBase == NULL) CleanUp();

    GfxBase
    = OpenLibrary("graphics.library", INTUITION_REV);
    if(GfxBase == NULL) CleanUp();

    /* Here the window is opened.
    /*
    gWindow
    = (struct Window *)OpenWindow(&aNewWindow);
    if(gWindow == NULL) CleanUp();

    /* If the correct number of arguments was passed
    /* from the command line, open the file and
    /* retab it. Also get the current time for
    /* DoubleClick(), and find out how many pixels
    /* per character in this screen.
    /*
    if(argc == 3)
    {
        gFilePtr = (char *)LoadAndRetabFile(argv[1],
        &gFileSize,
        &gFileTop,
        atoi(argv[2]));

        gLinePtr = gFilePtr;
        CurrentTime(&gLSecs, &gLMics);
        gCharLength = TextLength(gWindow->RPort, gTestString, 1);
    }

    /* DrawWindow() prints the retab'd file into the
    /* window. gFileSize contains the size of the
    /* retab'd file. If it is zero then there is no
    /* retab'd file. We will only draw the window if
    /* there is a file to print in it.
    /*
    if(gFileSize > 0)
        DrawWindow();

    /* The Main Loop. If there is a message, then
    /* the else block copies certain information
    /* from the IntuiMessage before replying to it.
    /* Then, HandleEvent is dispatched.
    /* This loop is executed as long as gDone is
    /* FALSE. gDone was set to FALSE at the
    /* beginning of the file when it was declared.
    /*
    while(gDone == FALSE)
    {
        intMessage = (struct IntuiMessage *)
        GetMsg((struct MsgPort *)gWindow->UserPort);

        if(!intMessage)
            WaitPort((struct MsgPort *)gWindow->UserPort);

        else
        {
            gClass = intMessage->Class;
            gCode = intMessage->Code;
            gCurSecs = intMessage->Seconds;
            gCurMics = intMessage->Micros;

            ReplyMsg(intMessage);

```



AMIGA—COMMODORE



REPLACEMENT CHIPS, PARTS AND UPGRADES

8520A CIA	\$17.95	A2000 Heavy Duty Power Supply	\$147.00
8364 Paula	\$39.95	A2000 Service Manual	\$ 39.00
1.3 Kickstart ROM	\$29.95	A500 Heavy Duty Power Supply	\$ 69.95
1 MEG x 1/100 NS	\$ 7.95	A500 Service Manual	\$ 36.50
1x4 MEG/80 ZIP (A3000)	\$54.95	A2000 Keyboard	\$114.95
256x4/80 NS	\$ 7.95	A500 Keyboard	\$109.50
A501-512K Upgrade RAM Board	\$69.95	A1000 Service Manual	\$ 29.95
8362 Denise (1/2 bright)	\$39.95	Keyboard for A1000	\$129.95
68010/10 (for extra speed)	\$15.95	68881/68882	CALL

Prices do not include UPS

• AMIGA UPGRADES •

— ECS - 1MB "FATTER AGNUS" CHIP (8372A) with FREE Chip Puller and NEW step-by-step 10 minute Instructions. \$99.50 plus UPS.

— MEGACHIP 2000 - A 2000 upgrade board allows 2 MB of chip RAM (uses new 2 MB AGNUS). You now get double the chip RAM to custom chips, more graphics and digitized audio, excellent for displaying graphics, solderless installation. Includes free chip puller. We even buy back your old 1 MB AGNUS. \$339.00 (Before Rebate)

— AMIGA 1000 REJUVENATOR UPGRADE - Tap the ultimate power of your Amiga 1000—utilize (ECS) Enhanced Chip Set, Fatter Agnus, 2.0 Kickstart ROM, more RAM (1MB), clock battery backup, simple solderless installation. 100% compatibility with all products/software. \$479.00 (Plus UPS). Send for the data sheet.

• IMPORTANT CATALOG ANNOUNCEMENT •

Call for your new 30 page catalog of specialty items for Amiga, Commodore and IBM. This free catalog contains: low cost replacement chips, upgrades, 34 diagnostic products, tutorial VHS tapes, interfaces, heavy duty power supplies (for A500 and A2000) and other worldwide products you won't find anywhere else. Dealers, use your letterhead.



THE GRAPEVINE GROUP, INC.

3 Chestnut St.
Suffern, NY 10901

Fax 914-357-6243

We Ship Worldwide

1-800-292-7445

914-357-2424

Prices Subject to Change

Circle 147 on Reader Service card.

```

HandleEvent();
}

CleanUp();
}

/* HandleEvent() dispatches the appropriate
/* function given the nature of the user
/* generated event. If it was a CLOSEWINDOW
/* event then the global gDone is set to TRUE.
*/

void HandleEvent()
{
    switch(gClass)
    {
        case CLOSEWINDOW:
            gDone = TRUE;
            break;
        case GADGETUP:
            HandleZoomBoxSelect();
            break;
        case NEWSIZE:
            HandleZoomBoxNewSize();
            break;
        case REFRESHWINDOW:
            HandleZoomBoxRefresh();
            break;
        case MOUSEBUTTONS:
            HandleMouseDown();
            break;
        default:
            break;
    }

    /* This function is called when the user either
    /* selects or de-selects the zoom box. First, it
    /* finds out which. If SELECTED, the window's
    /* size and position are recorded in the globals
    /* gLeftEdge, gTopEdge, gWidth, and gHeight.
    /* Then the window is zoomed out. If not
    /* SELECTED, the window is zoomed back.
    */

    void HandleZoomBoxSelect()
    {
        if(gZoomGadget.Flags & SELECTED)
        {
            gLeftEdge = gWindow->LeftEdge;
            gTopEdge = gWindow->TopEdge;
            gWidth = gWindow->Width;

```



```

gHeight = gWindow->Height;

MoveWindow(gWindow, ZOOM_LEFT-gWindow->LeftEdge,
ZOOM_TOP-gWindow->TopEdge);
SizeWindow(gWindow, gWindow->MaxWidth - gWindow->Width,
gWindow->MaxHeight - gWindow->Height);
}

else
{
SizeWindow(gWindow, gWidth - gWindow->Width,
gHeight - gWindow->Height);
MoveWindow(gWindow, gLeftEdge - ZOOM_LEFT,
gTopEdge - ZOOM_TOP);
}
}

/* When the user re-sizes the window, the Zoom
/* Box must be reset if the new size does not
/* conform to its current state. The empty else
/* blocks are included for completeness.
*/

void HandleZoomBoxNewSize()
{
if (gZoomGadget.Flags & SELECTED)
{
if ((gWindow->Width != gWindow->MaxWidth) ||
(gWindow->Height != gWindow->MaxHeight))
{
RemoveGadget(gWindow, (struct Gadget *) &gZoomGadget);
gZoomGadget.Flags &= (SELECTED ^ 0xffff);
AddGadget(gWindow, (struct Gadget *) &gZoomGadget, -1);
RefreshGList(gZoomGadget, gWindow, NULL, 1);
RefreshWindowFrame(gWindow);
}
}
else
{
}
}

else
{
}
}

/* Whenever the window has to be re-drawn, the
/* program receives a REFRESHWINDOW event. If
/* the window has been moved it will have to be
/* re-drawn. If the zoom box is selected and
/* the window is no longer in the upper left
/* corner, then the zoom box will be
/* de-selected. If there is a retab'd file, then
/* it will be drawn.
*/

void HandleZoomBoxRefresh()
{
BeginRefresh(gWindow);

if (gZoomGadget.Flags & SELECTED)
{
if ((gWindow->LeftEdge != ZOOM_LEFT) ||
(gWindow->TopEdge != ZOOM_TOP))
{
RemoveGadget(gWindow, (struct Gadget *) &gZoomGadget);
gZoomGadget.Flags &= (SELECTED ^ 0xffff);
AddGadget(gWindow, (struct Gadget *) &gZoomGadget, -1);
RefreshGList(gZoomGadget, gWindow, NULL, 1);
RefreshWindowFrame(gWindow);
}
}
else
{
}
}

if (gFileSize > 0)
DrawWindow();

EndRefresh(gWindow);
}

/* Cleanup() tests each object, and, if it is
/* not zero, frees or closes it.
*/

void Cleanup()
{
if (gWindow)
CloseWindow(gWindow);

if (IntuitionBase)
CloseLibrary(IntuitionBase);

if (GfxBase)
CloseLibrary(GfxBase);

if (gFilePtr)
FreeMem(gFilePtr, gFileSize);

exit(1);
}

/* This function first tests that the mouse
/* click was in fact the left mouse button and
/* that there is in fact a retab'd file. Then
/* it calls DoubleClick() with the current and
/* last values of seconds and micros. gLSecs,
/* gLMics, which hold the last values of seconds
/* and micros are set to their current values,
/* respectively. If there was a double click,
*/

```

```

/* then gLinePtr will be updated by one page
/* and that page will be printed in the window.
*/

void HandleMouseDown()
{
BOOL isDouble;

if ((gFileSize > 0) && (gCode == SELECTDOWN))
{
isDouble = DoubleClick(gLSecs, gLMics, gCurSecs, gCurMics);
gLSecs = gCurSecs;
gLMics = gCurMics;

if (isDouble)
{
gLinePtr = (char *) FindNewLinePtr();
DrawWindow();
}
}
}

```

LISTING TWO: ZoomBoxFunctions.c

```

/* File: ZoomBoxFunctions.c */

#include "exec/types.h"
#include "exec/memory.h"
#include "intuition/intuition.h"
#include "stdio.h"
#include "libraries/dos.h"
#include "libraries/dosextern.h"
#include "ZoomBox.h"

/* These are all the variables declared globally
/* in the main file. In order to be used here
/* they must be re-declared as type extern
*/

extern struct Window *gWindow;
extern UBYTE gDone;
extern ULONG gClass, gLSecs, gLMics, gCurSecs, gCurMics;
extern SHORT gLeftEdge, gTopEdge, gWidth, gHeight, gCharLength;
extern USHORT gCode;
extern char gBfrr[], *gFilePtr, *gFileTop, *gLinePtr, *gTestString;
extern int gFileSize;

extern struct Gadget gZoomGadget;

/* The job of this function is to determine the
/* line at which the next page should begin.
/* First, it finds the number of lines that can
/* be printed in the current window. Then it
/* scans upward through the file looking for
/* carriage returns ('\r') and newlines ('\n').
/* As it finds them it counts off the lines. If
/* this has taken it past the actual end of
/* the file (gFileTop), then it is set to point
/* back to the beginning again.
*/

ULONG FindNewLinePtr()
{
int numLines;
char *aLinePtr = gLinePtr;

numLines = (gWindow->Height -
(gWindow->BorderTop +
gWindow->BorderBottom)) / PIX_PER_LINE - 1;

while ((numLines > 0) && (aLinePtr < gFileTop))
{
if ((*aLinePtr == '\r') || (*aLinePtr == '\n'))
numLines--;

aLinePtr++;
}

if (aLinePtr >= gFileTop)
aLinePtr = gFilePtr;

return((ULONG) aLinePtr);
}

/* DrawWindow() clears the window by filling a
/* rectangle that is defined as the region of
/* the window within its borders. The rectangle
/* is filled in with the background color. The
/* number of lines that the window will hold is
/* calculated. The maximum length of line that
/* the window will hold is calculated. Starting
/* at the beginning of the current line, and for
/* as many lines as can be printed, the number
/* of characters for each line is determined and
/* that line is printed.
*/

void DrawWindow()
{
USHORT x, y;
BYTE oldFgPen;
int numLines, lineLength, i=0, maxLineLength;
register char *aLinePtr1, *aLinePtr2;
register struct Window *regWindow = gWindow;

/* Set the foreground pen to background color
/* and fill in the entire visible portion of the
/* window. Reset the foreground pen to its
/* original color.
*/

```



```

oldFgPen = regWindow->RPort->FgPen;
SetAPen(regWindow->RPort, regWindow->RPort->BgPen);
RectFill(regWindow->RPort,
    regWindow->BorderLeft,
    regWindow->BorderTop,
    regWindow->Width-regWindow->BorderRight,
    regWindow->Height-regWindow->BorderBottom);
SetAPen(regWindow->RPort, oldFgPen);

/* Find the number of lines that will fit in */
/* the window. */
numLines = (regWindow->Height -
    (regWindow->BorderTop +
    regWindow->BorderBottom)) / PIX_PER_LINE;

/* Set the starting left coordinate to the */
/* window's visible left edge. Set the */
/* starting vertical coordinate to the */
/* window's top visible edge plus the space */
/* necessary to render one line of text. */
x = regWindow->BorderLeft;
y = regWindow->BorderTop+regWindow->RPort->TxBaseline;

/* Set the maximum number of characters that */
/* will fit horizontally in this window. */
maxLineLength = (regWindow->Width -
    (regWindow->BorderRight+
    regWindow->BorderLeft)) / gCharLength;

/* Start at the beginning of the current page. */
aLinePtr1 = gLinePtr;

/* While there are lines left and we haven't */
/* gone over the top of the file. */
while((numLines) && (aLinePtr1 < gFileTop))
{
    /* Copy the current line pointer. */
    aLinePtr2 = aLinePtr1;

    /* Find the number of characters to print */
    /* for this line. */
    lineLength = 0;

    while((aLinePtr1 != '\r') &&
        (aLinePtr1 != '\n') &&
        (aLinePtr1 < gFileTop) &&
        (lineLength < maxLineLength))
    {
        lineLength++;
        aLinePtr1++;
    }

    /* Print them. */
    Move(regWindow->RPort, x, y+(i*PIX_PER_LINE));
    Text(regWindow->RPort, aLinePtr2, lineLength);

    /* Now find the next line */
    if((aLinePtr1 == '\r') ||
        (aLinePtr1 == '\n'))
        aLinePtr1++;

    else
    if(lineLength >= maxLineLength)
    {
        while((aLinePtr1 != '\r') &&
            (aLinePtr1 != '\n') &&
            (aLinePtr1 < gFileTop))
            aLinePtr1++;

        if(aLinePtr1 < gFileTop)
            aLinePtr1++;
    }

    /* Decrement the number of lines and */
    /* increment i, which indicates which line */
    /* from the top we are currently printing. */
    numLines--;
    i++;
}

/* This function gets the size of 'filename' and */
/* reserves memory to store 'filename' plus the */
/* additional space that will be required by the */
/* spaces. Then it opens 'filename' and loads it */
/* in, 1K bytes at a time, to the buffer gBftr. */
/* The file is retab'd to the reserved memory */
/* buffer. The value pointed to by 'filesize' is */
/* set to the total amount of memory reserved. */
/* The value pointed to by 'filetop' is set to */
/* point to the memory location after the last */
/* memory location is actually filled during the */
/* retab process. */
ULONG LoadAndRetabFile(filename, filesize, filetop, spaces)
char *filename, **filetop;
int *filesize, spaces;
{
    FILE *infile;
    int numChar, i, currentoutcol = 1, atempvalue;
    ULONG returnValue = NULL;
    register char *inbfp, *outbfp;

    *filesize = GetFileSize(filename)*MULTIPLIER;
    infile = fopen(filename, "rb");
    if(infile == NULL)
    {

```

The Memory Location

Amiga specialists! Full service Commodore dealer.
Commodore authorized Educational dealer.

Pulsar Power PC
4mb 2630 Card (25mhz 68030)
2322 Multi-Serial port card
1950 Multisync Monitor
AE High density 3.5" drive
Mi Graph Hand Scanner
Sharp JX-300 Color Scanner
Sharp JX-100 Color Scanner
Xapshot still video camera
Canon RP-420 Video printer



Gold Disk Office
Disney Animation Studio
BibleReader
Amax II
Home Front
Wings
Shadow of the Beast II
Black Gold
Heart of the Dragon
Pool of Radiance
Check Mate
Over Run
Second Front



The Memory Location

396 Washington Street
Wellesley, MA 02181
(617) 237 6846

Store hours: Mon.-Thur. 10-6, Fri. 10-8, Sat. 9-5

Commodore authorized repair on-premise. Low flat labor rate, plus parts.



Circle 107 on Reader Service card.

```

*filesize = 0;
return(returnValue);
}

returnValue = (ULONG)
AllocMem(*filesize, MEMF_PUBLIC|MEMF_CLEAR);

if(returnValue == NULL)
{
    *filesize = 0;
    return(returnValue);
}

outbfp = (char *)returnValue;

do
{
    numChar = fread(gBftr, sizeof(char), BUFFSIZE, infile);
    inbfp = gBftr;

    while((inbfp < (gBftr+numChar)) &&
        (outbfp < (char *) (returnValue+(*filesize))))
    {
        if(*inbfp == '\t')
        {
            atempvalue = (currentoutcol/spaces+1)*spaces;

            i = currentoutcol;
            while((i < atempvalue) &&
                (outbfp < (char *) (returnValue+(*filesize))))
                *outbfp++ = ' ', i++;

            currentoutcol = atempvalue;
        }
        else
        {
            if(*inbfp == '\r' || *inbfp == '\n')
                currentoutcol = 1;
            else
                currentoutcol++;

            *outbfp++ = *inbfp;
        }
    }
    inbfp++;
}
while((numChar == BUFFSIZE) &&
    (outbfp < (char *) (returnValue+(*filesize))))

*filetop = outbfp;

```

(continued on page 88)

PD Serendipity

*Insight
into the
World of
Public
Domain
Software
for the
Amiga*

NTSC-PAL V1.1

These two programs are great for both NTSC and PAL users. They allow owners with the new ECS 1MB Agnus chip (supplied with all new A500s, A2000s, and A3000s) to switch from PAL to NTSC. The author points out that NTSC to PAL has not been checked yet; still, no problems are foreseen. Users will either boot in PAL or NTSC.

Advantages to this are pointed out in the documentation. NTSC users can now get a better quality picture with PAL, while PAL users will have less interlace flicker with NTSC. BootNTSC and BootPAL run only from the CLI.

NTSC-PAL can be found on Fred Fish Disk #387. Includes Assembly source. *Author: Nico François*

SNOOPDOS V1.0

SnoopDOS is a utility that allows you to see AmigaDOS function calls. SnoopDOS opens a window that displays all the calls made by programs being run, plus it displays all libraries, devices and fonts that have been loaded. This is useful when trying to determine why a program will not run. You can check to see if all libraries, fonts, etc. are available to the program.

SnoopDOS can be run as is, or you can use the included settings, such as create printouts. The SnoopDOS window can be inactivated while the utility remains running. SnoopDOS can be found on Fred Fish Disk #388. Includes C source. *Author: Eddy Carroll*

RETAB V1.03

Retab is a useful utility that will change tabs to spaces, spaces to tabs, or change a tab size. Retab can be used on any text file. There are option settings to determine what type of formatting is desired. You can protect text inside quotes, brackets, etc. by using the "-p" option. The "-c" option was developed with the C programmer in mind. It is used in reformatting C source files.

Retab can be run from the CLI or Shell, and can be found on Fred Fish Disk #389. Includes binary only. *Author: Paul Klink*

UPDATES

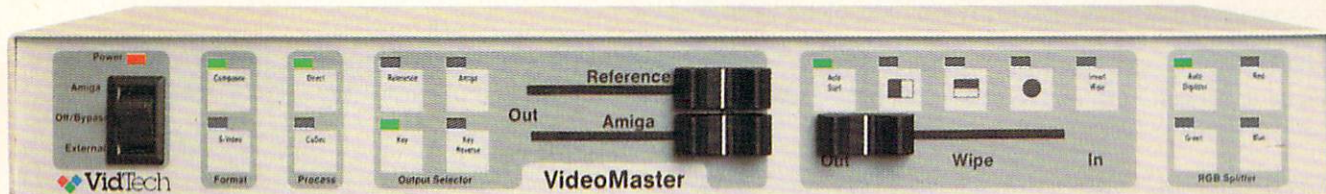
CrossDOS V4.00a is a mountable MS-DOS file system created by Consultron. This is a "read only" version (you can only read from the disk, you cannot write). You can contact Consultron for a full version. In this version a faster floppy device driver was added which can access data up to two times faster than the previous version.

A program, Install-MSDOSPS, is included to help you install CrossDOS on your hard drive. Minor alterations may be needed in your startup-sequence. Also included

by Aimée B. Abren

VideoMaster

The Integrated Desktop Video System For Amiga Computers



VideoMaster integrates in a single system all the functions necessary to transform the Amiga computer into a fully featured multimedia workstation without using the video slot. VideoMaster performs the following functions:

- ◆ Genlocks the Amiga graphics to incoming composite (PAL or NTSC) or S-Video source (S-VHS, Hi8 or ED-BETA).
- ◆ The genlocked video production is available in composite and S-Video formats as well as RGB for optimum graphics.
- ◆ A built-in RGB splitter provides for direct connection to a digitizer including a compatible interface to Digi-View Gold 4.0.
- ◆ A special effects generator produces horizontal, vertical, circle and inverted wipes—automatically timed or manually controlled.



Two Models

NTSC (RS-170A) and S-Video
PAL and S-Video 625

The S-Video, Y/C signal is processed independently in, through and out.

"Glitch Free" Switches

Cut to any Amiga/Reference video combination in the next frame of your recording with no flicker or artifacts.

Dissolve Control Bars

Dissolve to any Amiga/Reference Video combination. Also dissolve to black.

Wipe Switches and Control Bar

Vertical, horizontal and circle wipes timed by VideoMaster or controlled manually. Inverted or combined multiple wipes for special and unusual effects.

Digitize External Images

Connect your Digi-View Gold 4.0 digitizer, set RGB splitter to Auto and VideoMaster will synchronize the digitizer to R, G and B signals. Under manual control, select RGB sequence and interface to most commercially available digitizers—no B & W camera with color-wheel required.

**The S-VIDEO GENLOCK
for all Amigas
A-500/A-1000/A-2000/A-2500/A-3000**

RGB Processor

VideoMaster generates RGB video and graphics for direct connection to an RGB monitor or projector. The standard Amiga monitor can display reference video and Amiga graphics optimally in RGB mode.

Transcoding

Create composite productions from S-Video reference source. Create S-Video productions from composite reference video. VideoMaster output is continuously available in all three formats. (Composite, S-Video, and RGB).

Record with No Reference Video In

No problem! VideoMaster generates internal sync to allow the Amiga artist to record his animation in either composite or S-Video.

Amiga RGB Session

No recabling! Set VideoMaster to Off/Bypass and develop RGB graphics for your next production.

Key Out

Compatible with the video mixer in your studio ensemble.

Leave your Amiga Video Slot Open

For use with other video add-on cards that add sizzle to your productions.

External Power Supply

Required for A-500. Optional for all other Amigas.

Dealer Demonstration Program

Video dealers should contact VidTech for details.

Warranty and Support

VideoMaster comes with a full year warranty and 800 number for customer service and support.

Call or write us today:

VidTech International, Inc.

2822 NW 79th Avenue
Miami, Florida 33122
800-727-2261 or 305-477-2228
Fax 305-591-1651

Price: \$1295

Dealer inquiries invited.

U.S. Distribution by
Micro-Pace, Inc., Champaign, Ill.



is a *Technical Reference Manual* on disk along with an "In Case of Difficulty" file. The Technical files have an example mountlist, a small glossary, and device error codes. The Difficulty file contains a list of common problems that you may run into, along with suggested solutions.

CrossDOS V4.00a can be found on Fred Fish Disk #382. This is an update to version 3.05b on Fred Fish Disk #252. Includes source. *Author: Leonard Poma*

Msh V1.30 is an MS-DOS files system handler. This is patch 3 to release one. Msh V1.30 is fully functional with read and write capabilities.

With this new version, read error requesters no longer appear when a bootblock of a disk is unreadable. Also, the stack size of messydisk.device task and the file system was reduced.

Msh V1.30 can be found on Fred Fish Disk #382. This is an update to version 1.5 on Fred Fish Disk #327. Includes source. *Author: Olaf Seibert*

LHarc V1.21 is an archive program akin to ZOO and Arc. LHarc uses the LZHUF compression, and can store several files in one archive in a compressed form. This allows you to compress an entire floppy disk in one compression. One nice feature is that, when LHarc compresses, it retains the file attributes. LHarc has several commands and switches giving you a variety of compressing options.

A few bugs fixes were added to this version. Also, LHarc is now a "pure" program, so you can make LHarc resident using the AmigaDOS RESIDENT command.

LHarc V1.21 can be found on Fred Fish Disk #383. This is an update to version 1.10 on Fred Fish Disk #312. Includes binary only. *Author: Paolo Zibetti*

MandelMountains V2.1 renders 3-D images of the Mandelbrot & Julia sets. This is the turbo version, and it can run two to three times faster than version 2.0. You can define magnification windows to zoom deeper into the image.

With this version, the Workbench window will not be cleared during rendering, so the parameters remain visible. Also, the task priority is not changeable during computation.

MandelMountains V2.1 can be found on Fred Fish Disk #383. This is an update to version 2.0 on Fred Fish Disk #354. This program is Shareware. Includes binary only.

Author: Mathias Ortmann

Pcopy V2.11 is a disk-copying program useful for producing large amounts of different copies. Pcopy is not known to copy copy-protected disks; however, it does produce reliable copies because it can verify the written data.

Pcopy displays a "Copy History" window which keeps a record of all copied disks as well as a Progression window which graphically displays the copying process. A nice feature included with Pcopy is Track Salvage which has the ability to recover data from a damaged track. Pcopy can be executed from the CLI or Workbench.

Pcopy V2.11 can be found on Fred Fish Disk #383. This is an update to version 2.0 on Fred Fish Disk #243. Includes binary only. *Author: Dirk Reisig*

(ZoomBox, continued from page 85)

```
fclose(infile);

return(returnValue);
}

/* GetFileSize() creates a FileInfoBlock and
/* Locks the given 'filePathName'. The
/* FileInfoBlock is then filled with information
/* about the file by a call to Examine(). The
/* filesize is extracted and then returned to
/* the calling environment.
*/

int GetFileSize(filePathName)
char *filePathName;
{
    struct FileLock *aLock;
    struct FileInfoBlock *anInfo;
    int error, fileSize;

    anInfo = (struct FileInfoBlock *)
        AllocMem(sizeof(struct FileInfoBlock),
        MEMF_PUBLIC|MEMF_CLEAR);

    aLock = (struct FileLock *)
        Lock(filePathName,
        ACCESS_READ);

    error = Examine(aLock, anInfo);

    Unlock(aLock);

    fileSize = (int)anInfo->fib_Size;

    FreeMem(anInfo, sizeof(struct FileInfoBlock));

    return(fileSize);
}
```

LISTING THREE: ZoomBox.h

```
/* File: ZoomBox.h */

#ifndef ZoomBox_h
#define ZoomBox_h

/* Function prototypes. The C language assumes
/* that all functions return type integer unless
/* otherwise stated. If a function returns a
/* type other than integer, that function must
/* be declared before any function that calls it
/* is defined. These prototypes also help to
/* avoid errors during function calls. When they
/* occur, because of the prototypes, the
/* compiler can generate a warning.
*/

void Cleanup(void),
HandleEvent(void),
HandleZoomBoxSelect(void),
HandleZoomBoxNewSize(void),
HandleZoomBoxRefresh(void),
HandleMouseDown(void);

extern void DrawWindow(void);

extern ULONG FindNewLinePtr(void),
LoadAndRetabFile(char *,
int *,
char **,
int);

/* These are special purpose constants that will
/* be used by the program. One reason for
/* collecting them together like this is that
/* they may be changed easily. If instead of
/* defining WINDOW_WIDTH to be 120 we simply
/* used '120' everywhere it is needed in the
/* program we would have to remember all of
/* those places and change them separately if we
/* needed to. Using #define's, we just change
/* this one occurrence and the new value will
/* automatically be used when the program is
/* re-compiled.
*/

#define WINDOW_WIDTH 120
#define WINDOW_HEIGHT 80
#define MAIN_WINDOW_FLAGS
WINDOWSIZE|WINDOWDEPTH|WINDOWCLOSE|WINDOWDRAG|SIMPLE_REFRESH
#define WINDOW_MIN_WIDTH 80
#define WINDOW_MIN_HEIGHT 60
#define WINDOW_MAX_WIDTH 630
#define WINDOW_MAX_HEIGHT 190
#define ZOOM_LEFT 0
#define ZOOM_TOP 0
#define INTUITION_REV 33
#define BUFFSIZE 1024
#define SPACES 8
#define PIX_PER_LINE 8
#define MAX_LINE_LENGTH 80
#define MULTIPLIER 2

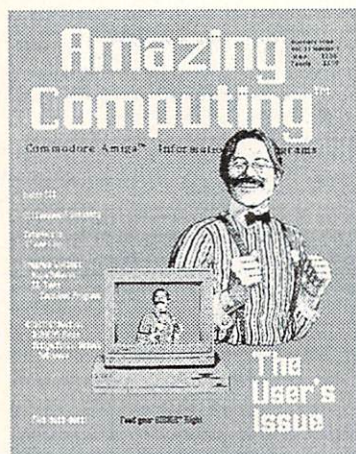
#endif
```

LISTING FOUR: ZoomBoxWith

```
/* File: ZoomBoxWith
FROM
lib:c.o, ZoomBoxMain.o, ZoomBoxFunctions.o
TO
ZoomBox
LIBRARY
lib:lc.lib, lib:amiga.lib
```

•AC•

•AC•



AC'S BACK ISSUE INDEX



Vol. 1 No. 1, Premiere, 1986

Highlights include:

- "Super Spheres", An ABASIC Graphics Program, by Kelly Kauffman
- "Date Virus", by J. Foust
- "EZ-Term", An ABASIC terminal program, by Kelly Kauffman
- "Miga Mania", Programming fixes & mouse care, by P. Kivolowitz
- "Inside CLI", A guided insight into AmigaDOS, by G. Musser

Vol. 1 No. 2, 1986

Highlights include:

- "Inside CLI: Part Two", Investigating CLI & ED, by G. Musser
- "Online and the CTS Fabrite 2424 ADH Modem", by J. Foust
- "SuperTerm V 1.0", A terminal program in Amiga Basic, by K. Kauffman
- "A Workbench 'More' Program", by Rick Wirth

Vol. 1 No. 3, 1986

Highlights include:

- "Forth!", A tutorial
- "Deluxe Draw!", An AmigaBASIC art program, by R. Wirth
- "AmigaBASIC", A beginner's tutorial
- "Inside CLI: Part 3", by George Musser

Vol. 1 No. 4, 1986

Highlights include:

- "Build Your Own 5 1/4" Drive Connector", by E. Viveiros
- "AmigaBASIC Tips", by Rich Wirth
- "Scrimper: Part One", A program to print Amiga screen, by P. Kivolowitz

Vol. 1 No. 5, 1986

Highlights include:

- "The HSI to RGB Conversion Tool", Color manipulation in BASIC, by S. Pietrowicz
- "Scrimper: Part Two", by Perry Kivolowitz
- "Building Tools", by Daniel Kary

Vol. 1 No. 6, 1986

Highlights include:

- "Mailing List", A basic mail list program, by Kelly Kauffman
- "Pointer Image Editor", by Stephen Pietrowicz
- "Scrimper: Part Three", by Perry Kivolowitz
- "Optimize Your AmigaBASIC Programs For Speed", by Steve Pietrowicz

Vol. 1 No. 7, 1986

Highlights include:

- "Try 3-D", An introduction to 3-D graphics, by Jim Meadows
- "Window Requesters in Amiga Basic", by Steve Michel
- "I C What I Think", A few C graphic progs, by R. Peterson
- "Your Menu Sir!", Programming AmigaBASIC menus, by B. Catley
- "Linking C Programs with Assembler Routines", by G. Hull

Vol. 1 No. 8, 1986

Highlights include:

- "Computers in the Classroom", by Robert Frizelle
- "Using Your Printer With The Amiga"
- "Using Fonts from AmigaBASIC", by Tim Jones
- "Screen SaVer", Monitor protection program in C, by P. Kivolowitz
- "A Tale of Three EMACS", by Steve Poling
- ".bmap File Reader in AmigaBASIC", by T Jones

Vol. 1 No. 9, 1986

Highlights include:

- "The Loan Information Program", A BASIC program for your financial options, by Brian Catley
- "Starting Your Own Amiga-Related Business", by W. Simpson
- "Keep Track of Your Business Usage for Taxes", by J. Kummer
- "Using Fonts from AmigaBASIC: Part Two", by Tim Jones
- "68000 Macros On The Amiga", by G. Hull

Vol. 2 No. 1, January 1987

Highlights include:

- "What Digi-View Is... Or, What Genlock Should Be!", by J. Foust
- "AmigaBASIC Titles", by Bryan Catley
- "A Public Domain Modula-2 System", by Warren Block
- "One Drive Compile", by Douglas Lovell
- "A Megabyte Without Megabucks", An internal megabyte upgrade, by Chris Irving

Vol. 2 No. 2, February 1987

Highlights include:

- "The Modem", Efforts of a BBS sysop, by Joseph L. Rothman
- "The ACO Project....Graphic Teleconferencing on the Amiga", by S. R. Pietrowicz
- "Flight Simulator II: A Cross Country Tutorial", by John Rafferty
- "A Disk Librarian In AmigaBASIC", by John Kennan
- "Creating And Using Amiga Workbench Icons", by C. Hansel
- "Build Your Own MIDI Interface", by Richard Rae
- "AmigaDOS Operating System Calls and Disk File Management", by D. Haynie
- "Working with the Workbench", by Louis A. Mamakos

Vol. 2 No. 3, March 1987

Highlights include:

- "An Analysis Of The New Amiga PCs (A2000 & A500)", by J. Foust
- "Subscripts and Superscripts in AmigaBASIC", by I. Smith
- "AmigaTrix", Amiga shortcuts, by W. Block
- "Intuition Gadgets", by Harriet Maybeck Tolly
- "Forth!", Put sound in your Forth programs, by Jon Bryan
- "Assembly Language on the Amiga", by Chris Martin
- "AmigaNotes", No stereo? Y not?, by Rick Rae

Vol. 2 No. 4, April 1987

Highlights include:

- "Jim Sachs Interview", by S. Hull
- "The Mouse That Got Restored", by Jerry Hull and Bob Rhode
- "Household Inventory System in AmigaBASIC", by B. Catley
- "Secrets of Screen Dumps", by Natkun Okun
- "Amigatrix II", More Amiga shortcuts, by Warren Block

Vol. 2 No. 5, May 1987

Highlights include:

- "Writing a SoundScape Module", Programming with MIDI, Amiga and SoundScape in C, by T. Fay
- "Programming in 68000 Assembly Language", by C. Martin
- "Using FutureSound with AmigaBASIC", Programming utility with real digitized STEREO, by J. Meadows
- "Waveform Workshop In AmigaBASIC", by J. Shields
- "Intuition Gadgets: Part II", by H. Maybeck Tolly

Vol. 2 No. 6, June 1987

Highlights include:

- "Modula-2 AmigaDOS Utilities", by S. Faiwizewski
- "Amiga Expansion Peripherals", by J. Foust
- "What You Should Know Before Choosing an Amiga 1000 Expansion Device", by S. Grant
- "68000 Assembly Language Programming", by Chris Martin

Vol. 2 No. 7, July 1987

Highlights include:

- "Video and Your Amiga", by Oran Sands III
- "Amigas & Weather Forecasting", by Brenden Larson
- "Quality Video from a Quality Computer", by O. Sands
- "Is IFF Really a Standard?", by John Foust
- "All About Printer Drivers", by Richard Bielak
- "68000 Assembly Language", by Chris Martin

Vol. 2 No. 8, August 1987

Highlights include:

- "Amiga Entertainment Products"
- "Modula-2 Programming"
- "Assembly Language"
- "Disk-2-Disk", by Matthew Leeds
- "Skinny C Programs", by Robert Niemersma, Jr.

Vol. 2 No. 9, September 1987

Highlights include:

- "Modula-2 Programming", Raw console dev. events, by S. Faiwizewski
- "AmigaBASIC Patterns", by Brian Catley
- "Programming with Soundscape", by T. Fay
- "Bill Volk, Vice-President Aegis Development", interview by Steve Hull
- "Jim Goodnow, Developer of Manx'C", interview by Harriet M Tolly

Vol. 2 No. 10, October 1987

Highlights include:

- "Max Headroom and the Amiga", by John Foust
- "Taking the Perfect Screen Shot", by Keith Conforti
- "Amiga Artist: Brian Williams", by John Foust
- "All About On-line Conferencing", by Richard Rae
- "Amiga BASIC Structures", by Steve Michel
- "Quick and Dirty Bobs", by Michael Swinger
- "Fast File I/O with Modula-2", by Steve Faiwizewski
- "Window I/O", by Read Predmore

Vol. 2 No. 11, November 1987

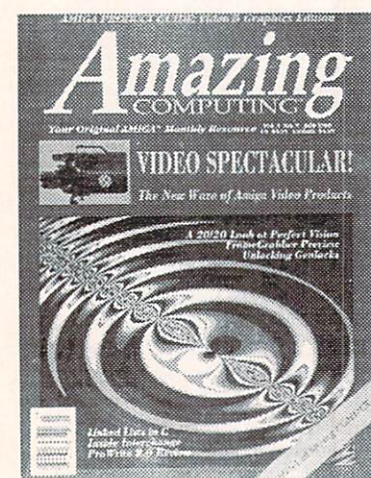
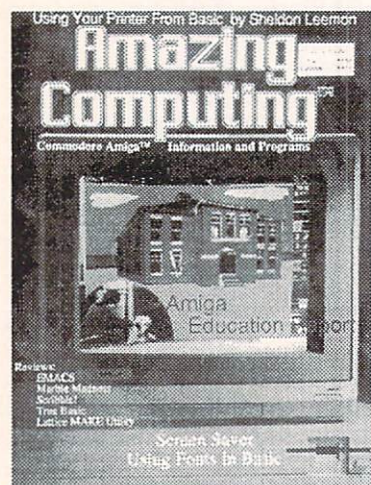
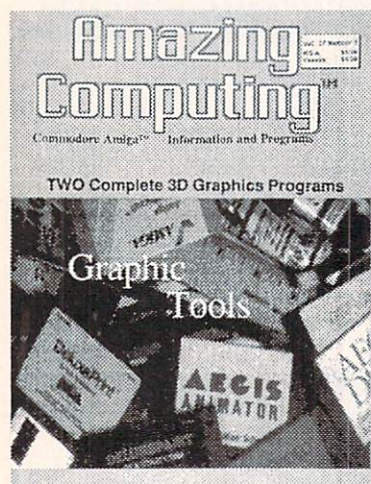
Highlights include:

- "Jez San Interview", StarGlider author speaks!, by Ed Bercovitz
- "Do-it-yourself Improvements To The Amiga Genlock"
- "Modula-2 Programming", Devices, I/O, & serial port, by S. Faiwizewski
- "68000 Assembly Language", by Chris Martin
- "The AMICUS Network", by John Foust
- "C Animation: Part II", by Mike Swinger
- "SoundScape Part III", VU Meter and more, by Todor Fay
- "Fun with Amiga Numbers", by Alan Barnett
- "File Browser", by Bryan Catley

Vol. 2 No. 12, December 1987

Highlights include:

- "The Sony Connection", by Stewart Cobb
- "CLI Arguments in C", by Paul Castonguay



"MIDI Interface Adaptor", by Barry Massoni
 "Modula-2", Command line calculator, by S. Faiwiszewski
 "AmigaNotes", Audio changes made in the A500 & A2000, by Rick Rae
 "Animation for C Rookies: Part III", by M. Swinger
 "The Big Picture", Assembly language programming, by Warren Ring
 "Insider/Kwikstart Review", RAM & ROM expansion: Comments & installation tips, by Ernest P. Viveiros, Sr.
 "Forth!", DumpRPort utility for your Multi-Forth toolbox, by Jon Bryan

Vol. 3 No. 1, January 1988
 Highlights include:
 "AmigaNotes", Amiga digital music generation, by Rich Rae
 "C Animation: Part IV", by Michael Swinger
 "Forth", Sorting out Amiga CHIP and FAST memory, by John Bryan
 "The Big Picture", CLI system calls and manipulating disk files, by Warren Ring
 "68000 Assembly Language Programming", Create a multi-color screen without using Intuition routines, by Chris Martin
 "Modula-2 Programming", by S. Faiwiszewski
 "The Ultimate Video Accessory: Part II", by L. White
 "FormatMaster: Professional Disk Formatting Engine", by C. Mann
 "BSpread", Full featured AmigaBASIC spreadsheet, by Bryan Catley

Vol. 3 No. 2, February 1988
 Highlights include:
 "Laser Light Shows with the Amiga", by Patrick Murphy
 "The Ultimate Video Accessory: Part III", by L. White
 "Photo Quality Reproduction with the Amiga and Digi-View", by Stephen Lebons
 "Solutions To Linear Algebra Through Matrix Computations", by Robert Ellis
 "Modula-2 Programming", Catching up with Calc, by Steve Faiwiszewski
 "68000 Assembler Language Programming", by Chris Martin
 "AiRT", Icon-based program language, by S. Faiwiszewski

Vol. 3 No. 3, March 1988
 Highlights include:
 "Desktop Video: Part IV", by Larry White
 "The Hidden Power of CLI Batch File Processing", by J. Rothman
 "A Conference With Eric Graham", edited by John Foust
 "Perry Kivolowitz Interviewed", by Ed Bercovitz
 "Jean 'Moebius' Giraud Interviewed", by Ed Fadigan
 "PAL Help", A1000 expansion reliability, by Perry Kivolowitz
 "Boolean Function Minimization", by Steven M. Hart
 "Amiga Serial Port and MIDI Compatibility for Your A1000", by L. Ritter and G. Rentz
 "Electric Network Solutions the Matrix Way", by Robert Ellis
 "Modula-2 Programming", The gameport device and simple sprites in action, by Steve Faiwiszewski
 "The Big Picture", Unified Field Theory by Warren Ring

Vol. 3 No. 4, April 1988
 Highlights include:
 "Writing A SoundScape Patch Librarian", by T. Fay
 "Upgrade Your A1000 to A500/2000 Audio Power", by H. Bassen
 "Gels in Multi-Forth", by John Bushakra
 "Macrobatics", Easing the trauma of Assembly language programming, by Patrick J. Horgan
 "The Ultimate Video Accessory: Part V", by Larry White
 "The Big Picture, Part II: Unified Field Theory", by W. Ring

Vol. 3 No. 5, May 1988
 Highlights include:
 "Interactive Startup Sequence", by Udo Pernisz
 "AmigaTrix III", by Warren Block
 "Proletariat Programming", Public domain compilers, by P. Quaid
 "The Companion", Amiga's event-handling capability, by P. Gosselin
 "The Big Picture, Unified Field Theory: Part III", by W. Ring
 "Modula-2", Termination modules for Benchmark and TDI compilers, by Steve Faiwiszewski
 "68000 Assembly Language", Peeling away the complication of display routines, by Chris Martin
 "The Command Line: The First Installment", by Rich Falconburg

Vol. 3 No. 6, June 1988
 Highlights include:
 "Reassigning Workbench Disks", by John Kennan
 "An IFF Reader in Multi-Forth", by Warren Block
 "Basic Directory Service Program", Programming alternative to the GimmeZeroZero, by Bryan Catley
 An Amiga Forum Conference with Jim Mackraz
 The Amiga market as seen by the "Stepfather of Intuition."
 The Command Line: Exploring the multi-talented LIST command", by Rich Falconburg

Vol. 3 No. 7, July 1988
 Highlights include:
 "An Interview with 'Anim Man,' Gary Bonham" by B. Larson
 "Roll Those Presses!", The dandy, demanding world of desktop publishing, by Barney Schwartz
 "Linked Lists in C", by W. E. Gammill
 "C Notes from the C Group", The unknown "C" of basic object and data types, by Stephen Kemp

Vol. 3 No. 8, August 1988
 Highlights include:
 "The Developing Amiga", A gaggle of great programming tools, by Stephen R. Pietrowicz
 "Modula-2 Programming", Libraries and the FFP and IEE math routines, by Steve Faiwiszewski
 "C Notes from the C Group: Arrays and pointers unmasked", by Stephen Kemp
 "TrackMouse", Converting a standard Atari trackball into a peppy Amiga TrackMouse, by Darryl Joyce
 "Amiga Interface for Blind Users", by Carl W. Mann
 "Tumblin' Tots", Assembly language program, by D. Ashley

Vol. 3 No. 9, September 1988
 Highlights include:
 "The Kideo Tapes", A Georgia elementary school puts desktop video to work, by John Dandurand
 "Speeding Up Your System", Floppy disk caching, by Tony Preston
 "Computer-Aided Instruction", Authoring system in AmigaBASIC, by Paul Castonguay
 "Gels in Multi-Forth, Part II: Screenplay", by John Bushakra
 "AmigaNotes: How IFF sound samples are stored", by Richard Rae
 "C Notes from the C Group", Operators, expressions, and statements in C uncovered, by Stephen Kemp

Vol. 3 No. 10, October 1988
 Highlights include:
 "The Command Line:NEWCLI: A painless way to create a new console window", by Rich Falconburg
 "Record Keeping for Freelancers: A Superbase Professional Tutorial", by Marion Deland
 "On The Crafting of Programs", Optimization kicks off our series on programming savvy, by David J. Hankins
 "Bob and Ray Meet Frankenstein", Create, animate, and metamorphose graphics objects in AmigaBASIC, by R. D'Asio
 "Digital Signal Processing in AmigaBASIC", Perform your own digital experiments with Fast Fourier Transforms, by Robert Ellis
 "HAM & AmigaBASIC", Pack your AmigaBASIC progs with many of the Amiga's 4096 shades, by Bryan Catley
 "CAI—Computer Aided Instruction: Part II", by Paul Castonguay

Vol. 3 No. 11, November 1988
 Highlights include:
 "Structures in C", by Paul Castonguay
 "On The Crafting of Programs", Speed up your progs, by D. Hankins
 "Desktop Video VI: Adding the Third Dimension", by L. White
 "More Linked Lists in C: Techniques and Applications", Procedures for managing lists, storing diverse data types in the same list, and putting lists to work in your programs, by Forest W. Arnold
 "BASIC Linker", Combine individual routines from your program library to create an executable program, by B. Zupke

Vol. 3 No. 12, December 1988
 Highlights include:
 "The Command Line: What to do when the commands of AmigaDos fail", by Rich Falconburg
 "Converting Patch Librarian Files", by Phil Saunders
 "The Creation of Don Bluth's Dragon's Lair", by R. Linden
 "Easy Menus in JForth", by Phil Burk

"Extending AmigaBASIC", The use of library calls from within AmigaBASIC, by John Kennan
 "Getting Started In Assembly", by Jeff Glatt
 "C Notes From The C Group: Program or function control coding", by Stephen Kemp
 "AmigaDOS, Assembly Language, And FileNotes", Weapons in the war against file overload; accurate, descriptive file naming, by Dan Huth

Vol. 4 No. 1, January 1989

Highlights include:

"Desktop Video", by Richard Starr
 "Industrial Strength Menus", by Robert D'Asto
 "Scrolling Through SuperBitMap Windows", by Read Predmore
 "Sync Tips: Dot crawl, the Amiga and composite video devices", by Oran J. Sands
 "Stop-Motion Animation On The Amiga", by Brian Zupke
 "The Command Line: New and Improved Assembly Language Commands", by Rich Falconburg
 "Pointers, Function Pointers, and Pointer Declarations in C", by Forest W. Arnold
 "Death of a Process", Developing an error-handling module in Modula-2, by Mark Cashman

Vol. 4 No. 2, February 1989

Highlights include:

"Max Morehead Interview", by Richard Rae
 "A Common User Interface for the Amiga", by Jim Bayless
 "SPY: Programming Intrigue In Modula-2", by Steve Faiwizewski
 "Sync Tips: Getting inside the genlock", by Oran Sands
 "On the Crafting of Programs: A common standard for C programming?", by D. J. Hankins
 "C Notes from the C Group: An introduction to unions", by Steven Kemp
 "The Command Line: Your Workbench Screen Editor", by Rich Falconburg
 "An Introduction to ARexx programming", by Steve Faiwizewski

Vol. 4 No. 3, March 1989

Highlights include:

"Fractal Fundamentals", by Paul Castonguay
 "Image Processing With Photosynthesis", by Gerald Hull
 "Benchmark 1: Fully Utilizing The MC68881", Part I: Turbocharging the savage benchmark, by Read Predmore
 "Breaking the Bmap Barrier", Streamline AmigaBASIC library access with Quick-Lib, by Robert D'Asto
 "Double Play", AmigaBASIC program yields double vision, by Robert D'Asto
 "The Video Desk: The Amiga meets Nikon Camera", by Larry White

Vol. 4 No. 4, April 1989

Highlights include:

"AmiEXPO Art and Video Contest Winners", by Steve Jacobs
 "Adding the Not-So-Hard Disk", by J. P. Twardy
 "The Max Hard Drive Kit", A hard drive installation project, using Palomax's Max kit, by Donald W. Morgan
 "Sync Tips: A clearer picture of video and computer resolutions", by Oran J. Sands
 "Passing Arguments", Step-by-step on how to pass data from the CLI to AmigaBASIC, by Brian Zupke
 "Creating a Shared Library", by John Baez

Vol. 4 No. 5, May 1989

Highlights include:

"The Business of Video", by Steve Gillmor
 "Building Your Own Stereo Digitizer", by Andre Theberge
 "MIDI Out Interface", by Br. Seraphim Winslow
 "Digitized Sounds in Modula-2", by Len A. White
 "Sync Tips: The secrets hidden beneath the flicker mode", by Oran J. Sands
 "Insta Sound in AmigaBASIC", by Greg Stringfellow
 "C Notes from the C Group: Formatted output functions", by Stephen Kemp

Vol. 4 No. 6, June 1989

Highlights include:

"Adventures in ARexx", by Steve Gillmor
 "At Your Request: Design your own requesters in AmigaBASIC", by John F. Weiderhorn
 "Exploring Amiga Disk Structures", by David Martin
 "Diskless Compile in C", by Chuck Raudonis

"Programming the '881 Part II", A discussion on how to calculate Mandelbrot & Julia sets, by Read Predmore
 "C Notes from the C Group: Ways to avoid problems when passing parameters between functions", by Stephen Kemp

Vol. 4 No. 7, July 1989

Highlights include:

"An Inside look at UltraCard", by Steve Gillmor
 "Adapting Analog Joysticks to the Amiga", by David Kinzer
 "Using Coordinate Systems: Part II of the Fractals series addresses the basis of computer graphics", by P. Castonguay
 Plus—A Look At Amiga Entertainment

Vol. 4 No. 8, August 1989

Highlights include:

"Getting Started in Video", by Richard Starr
 "C Notes: Directing programs via the Command Line", by Stephen Kemp
 "Executing Batch Files in AmigaBASIC", by Mark Aydelotte
 "Building a Better String Gadget", by John Bushakra
 "On Your Alert: Using System Alerts from BASIC", by John F. Wiederhorn

Vol. 4 No. 9, September 1989

Highlights include:

"Digitizing Color Slides And Negatives on the Amiga", by Ron Gull
 "Improving Your Graphics Programming", by R. Martin
 "Cell Animation In Modula-2", by Nicholas Cirasella
 "More Requesters In AmigaBASIC", by John R. Wiederhorn
 "DeluxePaint III — The Inside Story", EA's Dan Silva tells how DeluxePaint III evolved, by Ben & Jean Means
 "Amiga In Desktop Presentation", Presentation techniques to enhance your meetings and seminars, by John Steiner
 "Multitasking In Fortran", by Jim Locker
 "Gels In Multi-Forth: Part III", by John Bushakra

Vol. 4 No. 10, October 1989

Highlights include:

"Better TrackMouse", A true one-handed trackball mouse, by Robert Katz
 "Conference with Will Wright and Brian Conrad of SimCity fame", edited by Richard Rae
 "A1000 Rejuvenator, Conference with Gregory Tibbs", edited by Richard Rae
 "APL & The Amiga", by Henry Lippert
 "Saving 16-color pictures in high-resolution", Part Three of the Fractals Series, by Paul Castonguay
 "More requesters in AmigaBASIC", by John Wiederhorn
 "Glatt's Gadgets", Adding gadgets in Assembly, by Jeff Glatt
 "Function Evaluator in C", by Randy Finch
 "Big Machine On Campus", Humboldt State University in Northern California goes Amiga, by Joel Hagen.
 "Typing Tutor", by Mike "Chip" Morrison

Vol. 4 No. 11, November 1989

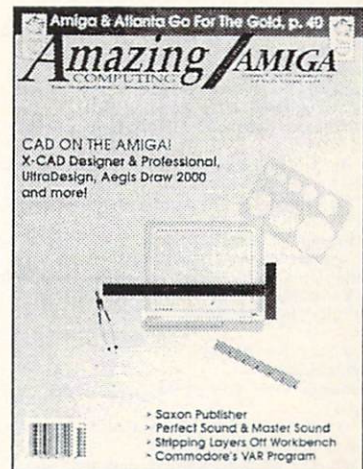
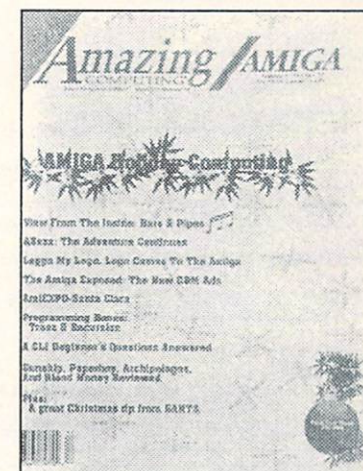
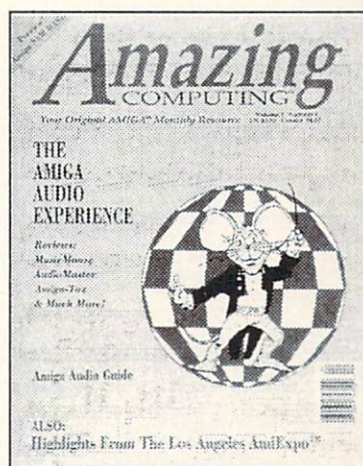
Highlights include:

"The Amiga Hardware Interface", by John Iovine
 "The Command Line: Examine the features in the AmigaDOS 1.3 Enhancer software package", by Rich Falconburg
 "C Notes from the C Group: Creating your own libraries in C", by Stephen Kemp
 "APL & The Amiga, Part II", by Henry Lippert
 "FastPix0", A faster pixel-drawing routine for the Aztec C compiler, by Scott Steinman
 "64 Colors In AmigaBASIC", by Bryan Catley
 "Fast Fractals", Generate Mandelbrot Fractals at lightning speed, by Hugo M.H. Lypkens
 "Multitasking in Fortran", by Jim Locker

Vol. 4 No. 12, December 1989

Highlights include:

"The MIDI Must Go Thru", by Br. Seraphim Winslow
 "View From the Inside: Bars&Pipes", Bars&Pipes designer gives a tour of Blue Ribbon Bakery's music program, by Melissa Jordan Grey
 "ARexx Part II", by Steve Gillmor
 "A CLI Beginner's Questions Answered", by Mike Morrison
 "Trees and Recursion", by Forest W. Arnold
 "C Notes from the C Group", A look at two compressing data techniques, by Stephen Kemp
 "The Command Line: Exploring commands in AmigaDOS", by Rich Falconburg
 "Amiga Circuits", The techniques required to input information via the parallel port, by John Iovine



Vol. 5 No. 1, January 1990

Highlights include:

"The Making Of The 1989 BADGE Killer Demo Contest Winner, The Sentinel", by Bradley W. Schenck
"Animation For Everyone", by Barry Solomon
"Animation With Sculpt-Animate 4D", by Lonnie Watson
"Animation? BASICally!", Using Cell animation in AmigaBASIC, by Mike Morrison
"Menu Builder", Building menus with intuition, by T. Preston
"Facing the CLI", Disk structures and startup-sequences, by Mike Morrison
"Dual Demo", Programming an arcade game, by Thomas Eshelman
"Scanning The Screen", Part Four in the Fractals Series, by Paul Castonguay
"It's Colder Than You Think", Calculating the wind chill temperature, by Robert Klimaszewski

Vol. 5 No. 2, February 1990

Highlights include:

"A Beginner's Guide to Desktop Publishing On The Amiga", by John Steiner
"A Desktop Publishing Primer", Clearing up some of the mystery surrounding printers.
"Resizing the shell/CLI Window", by William A. Jones
"Call Assembly Language from BASIC", by Martin F. Combs
"You Too Can Have A Dynamic Memory", Flexible string gadget requester using dynamic memory allocation, by Randy Finch
"An Amiga Conundrum", An AmigaBASIC program for a puzzle-like game, by David Senger
"View From The Inside: Scanlab", ASDG's President shares the development of ScanLab, by Perry Kivolowitz
"AMIGANET", by Ernest P. Viveiros, Jr.

Vol. 5 No. 3, March 1990

Highlights include:

"Screen Aid", A quick remedy to prolong the life of your monitor, by Bryan Catley
"An Introduction to MIDI", by R. Shams Mortier
"The Other Guys' Synthia Professional", review by David Duberman
"Passport's Master Tracks Pro vs. Blue Ribbon Bakery's Bars&Pipes", by Ben Means
"Microillusions' Music-X", review by Rob Bryanton
"Diemer Development's C-ZAR", review by R. Shams Mortier
"Dr. T's Keyboard Controlled Sequencer", review by Phil Saunders
"MusicTitr", Generating a titler display to accompany the audio on a VCR recording, by Brian Zupke

Vol. 5 No. 4, April 1990

Highlights include:

"Handling MS-DOS Files", Adapting your Amiga to MS-DOS using a 5.25" disk drive, by Jim Locker
"Bridging the 3.5" Chasm", Making Amiga 3.5" drives compatible with IBM 3.5" drives, by Karl D. Belsom
"Bridgeboard Q & A", by Marion Deland
"Handling Gadget & Mouse IntuiEvents", More gadgets in Assembly, by Jeff Glatt
"Ham Bones", Programming in HAM mode in AmigaBASIC, by Robert D'Asto
"Gambling with your video, Amiga-style", Problems with trading genlocks with your friends, by Oran Sands
"Distant Suns", review by Mike Hubbart

Vol. 5 No. 5 May 1990

Highlights include:

"Commodore's Amiga 3000", preview
"Newtek's Video Toaster", preview
"Getting started With Deluxe Video III", tutorial by David Johnson
"Do It By Remote", Building an Amiga-operated remote controller for your home, by Andre Theberge
"Turn Your Amiga 1000 Into A ROM-based Machine", by George Gibeau Jr. & Dwight Blubaugh
"Super Bitmaps In BASIC", Holding a graphics display larger than the monitor screen, by Jason Cahill
"Rounding Off Your Numbers", by Sedgewick Simons Jr.
"Faster BASIC Mouse Input", by Michael S. Fahrion
"Print Utility", by Brian Zupke

Vol. 5 No. 6, June 1990

Highlights include:

"Convergence", Part Five of the Fractal series, by Paul Castonguay
"C++: An introduction to object-oriented Amiga programming", by Scott B. Steinman
"APL and The Amiga: Primitive Functions and Their Execution", by Henry T. Lippert
"Amiga Turtle Graphics", by Dylan McNamee

"Building A Rapid Fire Joystick", by John Iovine

"The AM 512", Upgrade your A500 to a 1 megabyte machine, by James Bentley
"PageStream 1.8", review by John Steiner
"WordPerfect Macros", by Mike Hubbart
"DigiMate III", review by Frank Mc Mahon

Vol. 5 No. 7, July 1990

Highlights include:

"Commodore announces CDTV"
"Apples, Oranges, and MIPS: 68030-based Accelerators For The Amiga 2000", by Ernest P. Viveiros, Jr.
"Pixound", review by R. Shams Mortier
"Hyperchord", review by Howard Bassen
"Exceptional Conduct", Quick response to user requests, through efficient program logic, by Mark Cashman
"Poor Man's Spreadsheet", A simple spreadsheet program that demonstrates manipulating arrays, by Gerry L. Penrose
"Tree Traversal and Tree Search", Two methods for traversing trees, by Forest W. Arnold
"Crunchy Frog II", by Jim Fiore
"Getting to the Point: Custom Intuition Pointers In AmigaBASIC", by Robert D'Asto
"Synchronicity: Right & Left Brain Lateralization", by John Iovine
"Snap, Crackle, & POP!", Fixing a monitor bug on Commodore monitors, by Richard Landry

Vol. 5 No. 8, August 1990

Highlights include:

"Mimetics' FrameBuffer", review by Lonnie Watson
"The VidTech Scanlock", review by Oran Sands
"Amigas in Television", The Amiga in a cable television operation, by Frank McMahon
"Desktop Video in a University Setting", The Amiga at work at North Dakota State University, by John Steiner
"Credit Text Scroller", review by Frank McMahon
"Graphic Suggestions", Other ways to use your Amiga in video production, by Bill Burkett
"Title Screens That Shine: Adding light sources with DeluxePaint III", by Frank McMahon
"The Amiga goes to the Andys", by Curt Kass
"Breaking the RAM Barrier", Longer, faster, smoother animations with only one meg of RAM, by Frank McMahon
"Fully Utilizing the 68881 Math Coprocessor: Timings and Turbo_Pixel functions", by Read Premore
"APL and the Amiga: Part IV", by Henry T. Lippert
"Sound Quest's MidiQuest", review by Hal Belden

Vol. 5 No. 9, September 1990

Highlights include:

"Dr. T's Keyboard Controlled Sequencer 3.0", review by Phil Saunders
"Acting On Impulse", A visit to Impulse, by John Steiner
"3-D Professional", review by David Duberman
"Programming In C on a Floppy System", Yes even a stock A500 with a 512K RAM expander, by Paul Miller
"Time Out", Accessing the Amiga's system timer device via Modula-2, by Mark Cashman
"Stock Portfolio", An original program to organize your investments, music library, mailing lists, etc., by G.L. Penrose
"Voice-Controlled Joystick", by John Iovine
"FrameGrabber", review by Lonnie Watson
"KARAFonts", review by R. Shams Mortier
"Gradient Color Dithering on the Amiga Made Easy", by Francis Gardino
"Sculpt Script", by Christian Aubert
"The Art Department", review by R. Shams Mortier
"Scene Generator", review by R. Shams Mortier
"Breaking the Color Limit with PageRender3D", review by R. Shams Mortier

Vol. 5 No. 10, October 1990

Highlights include:

"Notes on PostScript Printing with Dr. T's Copyist", by Hal Belden
"BioMetal", Make the Amiga flex its first electric muscle, by John Iovine
"Atlanta 1996", Will Atlanta host the 1996 Summer Olympics? Their best salesperson is an Amiga 2500.
"Be A VAR!", With Commodore's new Value Added Reseller program, creating specialized Amiga applications could make you a VAR.
"CAD Overview: X-CAD Designer, X-CAD Professional, IntroCAD Plus, Aegis Draw 2000, UltraDesign", by Douglas Bullard
"Saxon Publisher", review by David Duberman
"AutoPrompt", review by Frank McMahon
"Centaur's World Atlas V2.0", review by Jeff James
"Sound Tools for the Amiga", Sunrize Industries' Perfect Sound and MichTron's Master Sound, reviews by M. Kevelson
"ProMotion", review by Michael Dispezio

"Stripping Layers Off Workbench", Remove unneeded files on your Workbench to make room for other programs, by Keith Cameron

"Audio Illusion", Produce fascinating auditory illusions on your Amiga, by Craig Zupke
"Call Assembly Language From Modula-2", Integrating small, fast machine language programs into BASIC, by Martin Combs
"Koch Flakes", Using the preprocessor to perform selective compilation, by Paul Castonguay
"New Products and Other Neat Stuff", Walt Disney animation comes to the Amiga, Alaska on videodisc, more.
"PD Serendipity", A look at SID V1.06 a directory utility for the Amiga, by Aimée Abren
"Bug Bytes", Upgrades this month include: F-BASIC 3.0, ProWrite 3.1, and shareware program GeoTime 1.2, by John Steiner
"Roomers", Will those people who bought an Agnus upgrade for their A2000 have to buy it again to get the new Denise chip?, by The Bandito
"C Notes from The C Group", A program that examines an archive file and removes any files that have been extracted, by Stephen Kemp

Vol. 5 No. 11, November 1990

Highlights include:

"Getting A Lot For A Little", A comparison of the available Amiga archive programs, by Greg Epley
"Amiga Vision", review by John Steiner
"Video Expo New York", The Camp multimedia show and Commodore in Manhattan
"High Density Media Comes to the Amiga", Applied Engineering's AEHD drive, review by John Steiner
"Fixing The Flicker", MicroWay's Advanced Graphics Adaptor 2000, by John Steiner
"The KCS Power PC Board", If you have an Amiga 500, and need IBM PC/XT software compatibility, the KCS Power PC Board can help, by Ernest P. Viveiros, Jr.
"Build An Amiga 2000 Keyboard For The Amiga 1000", Get a better-feeling keyboard for under \$7.00, by Phillip R. Combs
"Looking Beyond the Baud Rate", The Baud Bandit 2400 & Baud Bandit MNP/ Level 5 Plus modems, by Ernest P. Viveiros, Jr.
"New Products and Other Neat Stuff", Draw 4D, A-MAX II, and the GVP Series II RH-5500 top this month's list
"Bug Bytes", The Deskjet 500 has been released by Hewlett-Packard, by John Steiner
"PD Serendipity", more updates to the Fred Fish library. Plus, a look at SuperView 3.0, an IFF display program, by Aimée B. Abren
"C Notes From The C Group", Programming with definitions known as "enumerated" data types, by Stephen Kemp
"SAS/C Compiler", review by Bruce M. Drake
"Mindware's 3D Text Animator", review by Frank McMahon
"A Little Closer to Excellence", Micro-Systems Software's excellencel2.0, review by Kim Schaffer

Vol. 5 No. 12, December 1990

Highlights include:

"Twin Peaks Amiga Show Report", AC traveled to AmiEXPO in Anaheim, CA and World of Amiga in Chicago, IL to report on the newest and brightest Amiga products.
"Information X-Change", Keeping up to date on the latest news via hardware, software, and cable TV, by Rick Broida
"Stepper Motors", Part One of three part series on building a simple stepper motor, by John Iovine
"New Products", Gold Disk Office, Music-X, Jr., and holiday games.
"Bug Bytes", Workbench upgraded to 2.01 and Music-X upgraded to 1.1, by John Steiner
"C Notes From The C Group", A discussion on cryptography, by Stephen Kemp
"PD Serendipity", New CLI utilities and updates to the Fred Fish Collection, by Aimée B. Abren
"Pro Video Post", review by Frank McMahon
"Feeding The Memory Monster", the ICD AdRAM 540 and AdRAM 560D, review by Ernest P. Viveiros, Jr.
"McGee & McGee Visits Katie's Farm", review by Jeff James
"MathVision 2.0", review by R. Shams Mortier
"Wings", review by Rick Broida
"Making A Name For Yourself", Creating logos on the Amiga, by Frank McMahon
"Hard Disk Primer For Floppy Users", Taking the sting out of the transition from floppies to hard drive, by Rob Hays
"Shotgun Approach To Programming With AmigaBASIC", Bringing the fundamentals of AmigaBASIC programming into perspective, by Mike Morrison

The Fred Fish Collection

Due to the increasing size of the Fred Fish Collection, only the latest disks are represented here. For a complete list of all AC, AMICUS, and Fred Fish Disks, cataloged and cross-referenced for your convenience, please consult the current AC's Guide To The Commodore Amiga available at your local Amazing Dealer.

Fred Fish Disk 383

LHarc An archive program like Arc and Zoo, with a heavy emphasis on maximum compression for minimum archive size, using LZHUF compression. This is version 1.21, an update to version 1.10 on disk 312. Binary only. Author: Paolo Zibetti

LibraryKiller A small utility that allows you to remove libraries that aren't used anymore. Version 1.0, includes source in assembly. Author: Roger Fischlin

MandelMountains A program that renders three-dimensional images of blowups of the Mandelbrot set. Includes several example images. This is version 2.1, an update to version 2.0 on disk 354. The most significant enhancement for this version is that it is two to three times faster due to inclusion of a specially tuned fixed point arithmetic package. Shareware, binary only. Author: Matthias Ortmann

Pcopy An intuition based disk copier for AmigaDOS disks featuring high speed diskcopy with write verify, data recovery from damaged tracks, full multitasking compatibility, and a user friendly interface. This is version 2.11, an update to version 2.0 on disk 243, with new data recovery routines and some minor bug fixes. Binary only. Author: Dirk Reising

Fred Fish Disk 384

Contact Demo version of a "pop-up" program for managing personal contacts. Allows you to keep a name and address list along with phone numbers and comments. Can print mailing labels with a couple of mouse clicks (supports PostScript printers). Names and address can be "dipped" into other programs such as word processors, and Contact can even dial your modem for you. Version 1.0, binary only. Author: Craig Fisher, CME Software

Elements Very nice interactive display of the Periodic Table of Elements. Includes general row and column information, plus a test mode where the program asks specific questions about the selected element or row/column. This is version 2.3, an update to version 2.0 on disk 358. Binary only, shareware. Author: Paul Thomas Miller

NorthC A freely redistributable programming package containing all the programs required for developing in C. Based on the Scoblen Ltd C Compiler, Charlie Sides' assembler, the Software Distillery's linker, and portions from other sources. Steve has pulled everything together and added some enhancements in the process. This is version 1.2, an update to version 1.1 on disk 353. Changes include extra examples, many bug fixes, further documentation and some improvements. The environment is supplied compressed and unpacks to two disks. Partial source is included. Author: Steve Hawtin, Charlie Gibbs, Scoblen Ltd, The Software Distillery and many others.

Fred Fish Disk 385

MortCalc Yet another loan calculator, but this one was written with accuracy in mind. The monthly payments times the number of months should balance the total principal plus interest, to the cent. Version 2.5, freeware, source included. Author: Michel Lalonde

XLispStat A statistical program based on David Betz' XLisp. It does some of the most advanced dynamic statistical graphics, including brushing, linking, and 3D rotations. Menus and requestors can be created dynamically with simple lisp commands, and treated as lisp objects, so that the program could be used for many other non-statistical purposes, such as interactive expert systems. XLisp-Stat has an ARexx port so that an editor may be used to prepare lisp programs and send them directly to XLisp-Stat to be executed. Commands, as character strings, may also be sent from XLisp-Stat with the lisp command, "arexx". All graphics produced may be saved to files in IFF format. This version of XLisp-Stat (v2.1, release 1) has been ported to the Amiga by James Lindsey, from the Mac version supplied by Luke Tierney. Requires a numerical coprocessor (M68881/M68882) and an M68020/M68030 processor. This disk contains the executables, manual, and lisp files. The sources can be found on disk 386. Author: David Betz, Luke Tierney, James Lindsey

Fred Fish Disk 386

Statpack Demo version of a statistics and data manipulation program. Version 3.2, binary only. Author: James Lindsey

XLispStat A statistical program based on David Betz' XLisp. It does some of the most advanced dynamic statistical graphics, including brushing, linking, and 3D rotations. Menus and requestors can be created dynamically with simple lisp commands, and treated as lisp objects, so that the program could be used for many other non-statistical purposes, such as interactive expert systems. XLisp-Stat has an ARexx port so that an editor may be used to prepare lisp programs and send them directly to XLisp-Stat to be executed. Commands, as character strings, may also be sent from XLisp-Stat with the lisp command, "arexx". All graphics produced may be saved to files in IFF format. This version of XLisp-Stat (v2.1, release 1) has been ported to the Amiga by James Lindsey, from the Mac version supplied by Luke Tierney. Requires a numerical coprocessor (M68881/M68882) and an M68020/M68030 processor. This disk contains the sources. The executables, manual, and lisp files can be found on disk 385. Author: David Betz, Luke Tierney, James Lindsey

Fred Fish Disk 387

BlitterSand An interesting cellular automata program that gets its roots from a "sandpile". Intriguing to watch. Includes assembly source. Author: Mike Creutz

ExtFuncProc External Function Process. Allows execution of any library function from simple tasks even if these functions require a process environment. For experienced programmers only because there isn't any documentation written yet but only an example. ExtFuncProc is used by GMC. It runs under KS 2.0. Binary only. Author: Goetz Mueller

GMC A console handler with command line editing and function key support. GMC provides extended command line editing, function key assignment in four levels, extended command line history, online help for functions in the handler, and an iconify function. This is version 9.2, an update to version 4.0 on disk 251, with many new features, including an output buffer (dump to printer and window), filename completer, script function, undo function, prompt beeper, pathname in window title, close gadget for KS 2.0, etc. Shareware, binary only. Author: Goetz Mueller

H21 Translates C include files into assembler include files. Useful for programmers that use both C and assembler code in the same program. Helps to keep the structure definitions consistent. Version 1.1, shareware, binary only. Author: Goetz Mueller

MandAnim A Mandelbrot Animation program that allows you to easily generate series of lo-res/16-color pictures. Features full mouse and/or keyboard operation, zooms, auto-save, high (cheat) speed, iconization, etc. The generated pictures all remember their positions and settings so they can be re-loaded. Version 1.1, binary only. Author: Ekke Verheul

MandelBlitz Very fast Mandelbrot plotter with lots of handy features such as color cycling, zoom, special palette control, file requestors and more. Version 1.0, binary only. Author: Nico François

Menu A fast-access menu system configurable via a script file that allows the user run selected programs. Version 2.0, binary only. Author: Stefan Mörmann

NTSC-PAL Two programs that give A500/A2000 owners with the new ECS 1Mb Amiga installed the ability to boot into either a NTSC or PAL environment. "Very" useful for both NTSC and PAL owners alike. Version 1.1, includes assembly source. Author: Nico François

Wreq Replace "pop-up" requestors with line-oriented requestors (similar to those found in an MS-DOS environment) that can be easily handled from the keyboard. If there is no interactive console for the process, the requestor won't appear. Includes assembly source. Author: Tom Mickelson

Fred Fish Disk 388

Calc A shell style, command-line calculator. Calc does not have a fancy keypad display as many other calculator programs do. Instead, it is capable of taking its input from a file, the keyboard, or a command line and outputting its results to a file or the screen. It can also apply a single equation to all of the values stored in a file (or files). It handles all common mathematical expressions, can optionally predefine physical constants and store variables. Version 2.0, binary only. Author: Bill Dimm

DClock A "Dumb Clock" utility that displays the date and time in the Workbench screen title bar. This is version 1.27, an update version 1.12 disk number 325. Many more useful enhancements/bug fixes, including an ARexx interface. Includes source. Author: Olaf Barthel

DIED A full-screen ANSI editor including an animation utility. Provides PAL and NTSC compatibility. Many useful features such as horizontal and vertical block out/pasting operations, line/block/screen centering, save defaults and more. Version 2.4, binary only. Author: P-E Raue

Free Display how much free space (bytes or blocks) you have on any or all of your mounted disk volumes. Runs from CLI only. Based on "Free" by Tom Smythe

on Fish Disk 66, but totally rewritten and enhanced. Version 1.01, includes source. Author: Daniel Jay Barrett

KeyMapEd Allows you to change the KeyMaps used with SetMap. This is a full featured editor providing support for normal, string and dead keys. The keyboard represented is from an A3000/A2000/A500 but it is fully compatible with A1000 keyboards. This is version 1.11, an update to version 1.02 on disk number 193, binary only. Author: Tim Friest

SnoopDos A utility for monitoring AmigaDOS calls. In particular, it allows you to see what libraries, devices, fonts, environment variables or startup files a program is looking for. Very useful when you're trying to install a new application. Version 1.0, includes source in C. Author: Eddy Carroll

Fred Fish Disk 389

Kick Another screen hack, specifically for A500/A2000 owners. I don't want to spoil any surprises but reportedly causes some machines to crash. Binary only. Author: Tony Solomon, Paul Fortin

Plot A 3-D function plotting program with provisions for coordinate translation on both axes, parametric equations, and standardized notation of the pow function (x^y — which now works as specified). This is version 5.1, an update to version 4.1 on disk 175, with some enhancements and bug fixes. Binary only. Author: Terry Gintz

PolySys An extended version of the OL-system (string rewriting) described in The Science of Fractal Images (edited by Pietgen and Saupe). The basic algorithm has been expanded and modified extensively, and looping commands similar to those found in other Turtle graphics systems (Logo, etc) have been added. Support for three-dimensional drawing, with perspective, is also included. Version 1.0, binary only. Author: Terry Gintz

Retab Useful command-line "tab-to-space" and "space-to-tab" expansion utility. Several command-line options to specify size/settings and the ability to protect material enclosed by delimiters (quotes, brackets, carats, etc.) from expansion. Version 1.03, binary only. Author: Paul Klink

ZPlot Graphs formulas based on 4-D complex number planes. ZPlot currently supports the Mandelbrot set, Julia sets, and Phoenix curves, with over 500 mapping variations. The math functions supported include sin(z), sinh(z), z^n, e^z, z^n, sqrt(z), cosh(z), tanh(z), tanh(z), log(z), ln(z) and n^z. Version 1.3a, binary only. Author: Terry Gintz

Fred Fish Disk 390

Flip Allows you to quickly and easily switch between various screens. Can close screens, pull them up, and activate windows. Has the unique feature of sorting screens in a way that all title bars are visible at one time. This is version 2.0, binary only. Author: Lars Eggert

ReadMeMaster A nifty little database for finding those programs that you know exist somewhere (???!) in the AmigaLeDisk library. Maintains a keyword dictionary of the Contents descriptions that allows searching by disk number, program title, author's name, or some other descriptive word. Currently supports disk 1-360, an update to the version on disk number 163. Binary only. Author: Harold Morash

SetClock A utility to set or read the hardware clock on a Spirit Technology memory expansion board. Works in a manner similar to the SetClock utility which is supplied by Commodore with Amigas that have hardware clocks as standard equipment. Includes source in PCOPascal and assembler. Author: Willi Kusche

SM Small utility to center the display. Recorded version of "ScreenShift" by Anson Mah (Disk 88), only half the size. Includes source. Author: Anson Mah, Lattio V5.04 recording by Oliver Wagner

Fred Fish Disk 391

Curses A link library containing many of the terminal independent standard "curses" functions. Designed primarily for those interested in porting unix screen based programs to the Amiga. Version 1.10, binary only. Author: Simon John Raybould

Eco An ECHO replacement which allows many escape sequences for colors, text styles, cursor positioning, system variables, and much more. Has PURE bit set and can be made resident. Version 3.40, includes source. Author: Dario de Judicibus

FractalLab Investigate the realm of fractals and allow your imagination to run wild. Virtually an unlimited number of these self-similar curves can be created with FractalLab. Includes several interesting samples. Version 1.0, binary only. Author: Terry Gintz

ListPlot A 2D plotting program built around the PLPLOT plotting library. Its principle advantage is that it supports a variety of graphics devices. By default, output is sent to a window on the Amiga's screen. Through command line options, the graph can be sent to any preferences printer with graphics capability, stored as an IFF file, stored in HPGL

format, stored in Aegis Draw format, or stored as an Encapsulated Postscript File. A variety of line styles and colors are available. Includes source. Author: Frederick R. Bartram and Anthony M. Richardson

Fred Fish Disk 392

BTNTape A "Better Than Nothing" SCSI tape device handler. It provides fast file access to a SCSI tape drive from application programs using simple DOS calls to Read() and Write(). It can also be used with the Amiga TAR utility for disk backups. Files may span multiple tape volumes and may start at any tape block. This handler requires a "SCSI-direct" compatible hard disk driver. Version 1.0, includes source. Author: Robert Rethemeyer

CPlot Graphs linear functions in two dimensions, similar to a Mandelbrot plot. You start with a linear function like 10sin(x**2+y**2) and CPlot treats each point on the screen as an X-Y coordinate, color-scaling it according to its magnitude for a preset range of inputs. Includes some very nice sample creations. Version 1.0, binary only. Author: Terry Gintz

Pmode Very simple command line utility to send escape sequences to the printer to change print styles. Specifically tested a NEC P6 Plus, but it should work with many printers. Includes source should make it easy to add more escape sequences. Author: Dario de Judicibus

SetNoClick Very simple program to set the NOCLICK flag in the public section of a trackdisk unit. Only works with version 36 and up of trackdisk device. Includes source. Author: Marc Boucher

Spades Amigaized version of the popular card game. This is a single player version, where you play one hand and the computer plays your partner and also your two opponents. Version 1.1, includes source. Author: Greg Steimack

Fred Fish Disk 393

FileIO The dissidents file requester. This is version 1.9, an update to version 1.6 on disk 348. Binary only. Author: Jeff Glatt, Dissidents Software

FontConvert A printer font conversion program to convert standard Amiga fonts into a form suitable for downloading to a printer that supports user defined printer fonts. Version 1.0, includes source. Author: Olaf Barthel

FuncLib A program that allows you to add or remove rexx function libraries. Author: Jeff Glatt, Dissidents Software

ILBMLib A shared library (lib.library) to read/write IFF files, derived from the EA IFF code, along with various enhancements. Version 0.3, a partial update to version on disk 348. Author: Jeff Glatt, Dissidents Software

LibTool A program that allows you to develop C or assembly code, and then quickly turn it into a shared library. Also generates all support files for your library including Pragma files (both Manx and Lattice), bmap files, include files, C interface glue files. Can be used to make a device, too. Author: Jeff Glatt, Dissidents Software

PrintSpool A small print spooling shared library that provides an easy way to print graphics and text for any application. It can print asoi text of any length or dump any part or all of a raster. Takes care of opening the printer device and manages its own resources. Version 0.1, binary only, with source code examples. Author: Jeff Glatt, Dissidents Software

RexxIntuition This is an ARexx function library that allows you to open windows/screens from an ARexx script, attach menus, gadgets, (file) requestors, load and save ILBM picture files, auto-requestors, print text and graphic dumps, and completely interact with the user in an intuition environment. Adds all of those Amiga features that ARexx lacks. Author: Jeff Glatt, Dissidents Software

RexxLib A shared library that can be easily used by any C or assembly programmer to add an ARexx interface to his programs. Handles all of the messy details including message creation/delivery and error handling. Author: Jeff Glatt, Dissidents Software

Fred Fish Disk 394

Aniptrs3 Some more animated pointers to choose from to "liven" up your display environment. Other pointers from Bob are on disks 332 and 364. Binary only. Author: Bob McKain, pointer animation program by Tim Kemp

Liner A shareware outliner whose function is to create outlines for notes or export to other programs. 'Liner' can save an outline as ASCII text, and is clipboard compatible. Enhancements over the previous version include support for ARexx, Workbench, overscanned screens, more than one line of text per outline number, a preferences file, and search/replace. Version 2.00, an upgrade to version 1.32 on disk 265. Includes C source. Author: Dave Schreiber

Some miscellaneous pictures with a "cartoon" theme. Author: Bob McKain	CCLib	An implementation of the standard C runtime library, with a few extra goodies thrown in. Supports a large number of functions including stream I/O, low-level I/O, string, memory, linked list, sorting, time, process control and more. Version 3.0, includes source and several utility programs. Author: Robert W. Altshoff	Fred Fish Disk 403	A program to recover as much as possible from a defective disk. It can sometimes recover damaged (unreadable) tracks, check file integrity, check the directory structure, delete files, copy or show files, fix corrupted directory pointers, etc. Full intuition interface. This is version 1.2, an update to version 1.0 on disk 223. Binary only. Author: Werner Guenther	Flex	Flex is a replacement for the UNIX "lex" (lexical analyzer generator) program that is faster than lex, and freely redistributable. This is version 2.3, an update to the version on disk 156. Includes source. Authors: Jeff Poskanzer, Vern Paxson, William Lotius, et al.			
PrintImage A simple program that provides an easy way to print IFF ILM images. Version 1.0, includes source. Author: Olaf Barthel	PrettyWindows	Three different C routines to add various borders inside of windows. Includes source and a demo. Author: Thom Robertson	KawaEditor	A Kawa K4 editor (apparently some kind of midi based music synthesizer). Version 1.0, shareware, binary only. Author: Jan Sautke	WonderSound	Wondersound is an additive harmonic instrument design tool with a separate envelope design window and 16 relative harmonic strength and phase angle controls. Version 1.4, binary only. Author: Jeffrey Hamilton			
Fred Fish Disk 395 This disk is on hold due to copyright questions	TrackDisplay	A simple program that continuously monitors and displays the current track for each floppy disk. Includes source. Author: Olaf Barthel	NiftyTerm	NiftyTerm is an h19/VT102/VT52 emulator for the Amiga. It was originally designed to be used with DNet, but it has been expanded so that it may be used as a normal terminal emulator. NiftyTerm was designed to be a good emulation of these terminals, as well as being fairly small and fast. Version 1.0, binary only, source available from authors. Author: Christopher Newman, Todd Williamson	Fred Fish Disk 406	A utility that monitors a CLI's console I/O and copies it to a user specified file. The console I/O is unaffected by this monitoring. Version 1.00, includes source. Author: Matthew Dillon			
ColorCatch A utility that lets you grab colors from a screen and save them as an executable file. Version 1.0, includes source in assembler. Author: Preben Nielsen	Fred Fish Disk 400	DriveWars	DriveWars is a Shareware shoot'em up game that pits you, d0, or d11, against a computer virus that is out to destroy all U.S. records of Iraq's positions during operation Desert Shield. In version 1.0, you must fly d0; through the computers and destroy all contaminated chips and disks. Author: Joe Angell	KickDate	Saves and retrieves the current system date stamp to the first sector of the Kickstart disk. This is handy for A1000 users with auto-booting hard drives, since it can save the system time across system resets and power cycles. Version 1.0, includes source. Author: Joe Porke	DCmd	A utility that monitors a CLI's console I/O and copies it to a user specified file. The console I/O is unaffected by this monitoring. Version 1.00, includes source. Author: Matthew Dillon		
NewLook A program that changes the system gadgets in all the screens and windows. Version 1.0, includes source in assembler. Author: Preben Nielsen	ParNet	The Software Distillery's NET: file system using Matt Dillon's parallel port code. Using a special DB25 cable, two Amigas can be connected via the parallel port. One Amiga can mount the other as a device and read/write the files as if they were local. Version 2.4, binary only. Author: Doug Walker, John Toebes, Matt Dillon	PokerDemo	Demo version of some Solitaire card games from UnSafe Creations. Includes "Accordian", "Calculation", "Poker Solitaire", and "SeaHaven Towers". Binary only. Author: Steve Francis	MoniDie	A cute little "screen hack". Be sure to turn up the sound. Binary only, source available from author. Author: David Dorley			
PBar An editor to change the pattern in the windows drag bar and save the pattern as an executable file with an icon looking like the pattern. Version 1.0, includes source in assembler. Author: Preben Nielsen	ReqLib	A runtime, reusable library designed to make it easier for programmers to use powerful, easy to use requesters, for communicating with users. Includes such functions as a color requester, file requester, message display requester and many functions to make the creation of gadgets for your own custom requesters easier. Binary only. Author: Colin Fox and Bruce Dawson	RexxHostLib	This is a shared library package to simplify the ARexx host creation management procedure. Rexx-message parsing is also included making it possible to control ARexx from programs such as AmigaBASIC (can you imagine AmigaBASIC controlling AmigaText?). This is version 36.14, an update to version 34.12 on disk 355. Differences include a few bug fixes and new functions. Includes source. Author: Olaf Barthel	Post	An excellent PostScript interpreter for the Amiga which supports the full Adobe language and type 1 PostScript fonts. Includes Charter font in Roman, Italic, Bold, and Bold-Italic, and Courier font in Roman, Roman-Oblique, Bold, and Bold-Oblique. Requires Arp library V39+ and Conkran V1.3+. Version 1.3, includes source in C. Author: Adrian Aylward			
PCalendar A little calendar program which lets you look through years and months using the arrow-keys. Version 1.0, includes source in assembler. Author: Preben Nielsen	SetCPU	A program designed to allow the user to detect and modify various parameters related to 32 bit CPUs. Includes commands to enable or disable the text/data caches, switch on or off the '030 burst cache line fill request, use the MMU to run a ROM image from 32-bit memory, and to report various parameters when called from a script. This is version 1.60, an update to version 1.5 on disk 223. Includes source. Author: Dave Haynie	Fred Fish Disk 404	LHarc	An archive program like Arc and Zoo, with a heavy emphasis maximum compression for minimum archive size, using LZHUF compression. This is version 1.30, an update to version 1.21 on disk 383. Binary only. Author: Paolo Zibetti	Fred Fish Disk 408	An excellent shareware Star Trek game. The object of the game is to stay alive, healthy, and maintain the Enterprise in good condition. As Captain of the ship, you must go on missions where you show your common sense and level headedness. An overly cautious Captain will lose his ship as well as a careless or irrational Captain. This distribution unpacks into two almost full disks. Version 1.0, binary only. Author: Tobias Richter		
PClock A little clock program which shows the time and the available CHIP and FAST memory. Version 1.0, includes source in assembler. Author: Preben Nielsen	SF2	File search utility. Default searching starts from the root directory of the specified device and descends down into its subdirectories. Searching includes looking into archive files generated by various compression utilities. Archive files ending with a .ARC, .LHZ, .ZIP, and .ZOO are currently supported. Lots of command line options. Requires ARP 1.3 (rev. 39.1). Version 2.0, binary only, shareware. Author: Andrea Sautoni	NGTC	Release One of a trivia game based on "Star Trek: The Next Generation" TV series. Contains over 500 questions on Season One of the series with over 50 audio-video clues. This disk contains part 2 of the Trivia Database and the "Projector" player. You MUST have disk 404 which contains the rest of the Trivia Database and the game module. Created with The Director. Binary only. Author: Gregory Epley	MechFight	A role playing game where you explore a world, buy or find items, and fight against robots and aliens. During the game you are asked to perform certain tasks. This is version 1.0, binary only. Author: Florian Marquardt			
PFlir A very good and small file requester to link onto your own programs. Version 1.0, includes source in assembler. Author: Preben Nielsen	TurboTopaz	Two Text speed up programs like FastFonts. Allows replacement of the Topaz-80 font from both CLI and WorkBench. Includes a program to measure to speed of Text speed up programs. Version 1.0, includes source in assembler. Author: Preben Nielsen	Fred Fish Disk 405	GIFMachine	A program that will convert CompuServe GIF image files into IFF SHAM and 24bit ILMs. It offers a number of extra options like dithering, horizontal and vertical flip, as well as automatic border removal. Requires KickStart version 2.0 or greater to run. Version 2.104, includes source. Author: Christopher Wichura	Vit	VLT is both a VT100 emulator and a Tektronix (4014 plus subset of 4105) emulator, currently in use at SLAC (Stanford Linear Accelerator Center). Although the VT100 part was originally based on Dave Wecker et al.'s VT100, many enhancements were made. Features include use of ARP, an ARexx port, XMODEM 1K/CRC and Kermit protocols, support for additional serial ports, external file transfer protocols (XPR), a "chat" mode, and scrollback/history buffer. It comes in two versions, one with Tektronix emulation, and one without. The Tektronix emulation allows saving IFF files, PostScript files, and printing bitmaps to the printer. This is version 4.646, an update to version 4.428 on disk 308. Binary only. Author: Willy Langeveld		
Resident A resident startup module for Amiga C. Version 1.0, includes source. Author: Olaf Barthel	DKBTrace	A complete ray tracer that supports arbitrary quadric surfaces (spheres, ellipsoids, cones, cylinders, planes, etc.), constructive solid geometry, and various shading models (reflection, refraction, marble, wood, and many others). It also has special case code to handle spheres, planes, triangles, and smooth triangles. By using these special primitives, the rendering can be done much more quickly than by using the more general quadrics. This is version 2.0 and includes source in C. Author: David Buck	Fred Fish Disk 401	CrCLists	Complete CRC check files for disks 001-400 using the brik program. These were made directly from my master disks. This is an update to the lists on disk 293. Author: Fred Fish	To Be Continued.....			
RoadRoute Trip planner program to find "best road route" between any two points of travel. Features include the user customization of CITIES and ROADS files to suit travel interests and provision for very large city menus and itineraries. Also includes RoadScan, a checker for RoadRoute files (CITIES and ROADS). Very large files may contain goals (cities with no roads, the same road entered twice, etc.), or oddities (direct road not as fast as multipoint). These are pointed out, together with areas where users might wish to make economies in the data base. Version 1.6, an update to version 1.5 on disk 358, includes source. Author: Jim Butterfield	Fred Fish Disk 397	HappySong	A song created using the freely distributable program MED V.2.10. Player program included. Author: Alex Van Starex	NGTC	Release One of a trivia game based on "Star Trek: The Next Generation" TV series. Contains over 500 questions on Season One of the series with over 50 audio-video clues. This disk contains part 2 of the Trivia Database and the "Projector" player. You MUST have disk 404 which contains the rest of the Trivia Database and the game module. Created with The Director. Binary only. Author: Gregory Epley	In Conclusion	Of our knowledge, the materials in this library are freely redistributable. This means they were either publicly posted and placed in the public domain by their authors, or they have restrictions published in their files to which we have adhered. If you become aware of any violation of the authors' wishes, please contact us by mail.		
Fred Fish Disk 398	DClock	A "Dumb Clock" utility that displays the date and time in the Workbench screen title bar. Includes an ARexx interface. This is version 1.29, an update to version 1.27 on disk 388. Includes source. Author: Olaf Barthel	Fred Fish Disk 402	ADoc	A freely redistributable help utility for the Amiga. Allows you to have permanent help on any subject you want. Major feature is automatic searching of the word on which you clicked. Includes a 50 Kb help file (French only) on all intuition and Dos function calls. This is version 3.10, binary only, French and English versions. Author: Denis GOUNELLE	Important Notice!	This list is compiled and published as a service to the Commodore Amiga community for informational purposes only. Its use is restricted to non-commercial groups only! Any duplication for commercial purposes is strictly forbidden. As a part of Amazing Computing™, this list is inherently copyrighted. Any infringement on this proprietary copyright without expressed written permission of the publishers will incur the full force of legal actions.		
Formatter A faster and more user friendly floppy disk formatter that is also an example of how to format Amiga file systems in general and get AmigaDOS to accept them. Formatting without verify takes about 50 seconds, with verify takes about 100 seconds. Version 2.7, includes source. Author: Olaf Barthel	GMC	A console handler with command line editing and function key support. GMC provides extended command line editing, function key assignment in four levels, extended command line history, online help for functions in the handler, and an iconify function. Also includes an output buffer (dump to printer and window), filename completer, script function, undo function, prompt keeper, pathname in window title, close gadget for KS.2.0, etc. This is version 9.6, an update to version 9.2 on disk 387. Shareware, binary only. Author: Goetz Mueller	APH	A freely redistributable printing utility for the Amiga. Major features are full intuition interface, preview function, page selection, margins setup, line numbering, and more. This is version 2.62, binary only, French and English versions. Author: Denis GOUNELLE	DirWork	A fast small simple efficient shareware DirUtility that gets directories off floppies in about half the normal time. Configurable options and buttons, as well as all the usual features. This is version 1.12, an update to the one on disk 328. Binary only. Author: Chris Haines			
HunkFunk A program to "disassemble" any given AmigaDOS hunk file, which includes executables, linker libraries, linker object files, overlay files, etc. Written as an exercise by the author to learn a few things about AmigaDOS hunk structures. Includes source. Author: Olaf Barthel	PCopy	An intuition based disk copier for AmigaDOS disks featuring high speed diskcopy with write verify, data recovery from damaged tracks, full multitasking compatibility, and a user friendly interface. This is version 2.12, an update to version 2.11 on disk 383, with new data recovery routines and some bug fixes. Binary only. Author: Dirk Reisig	PLW	Phone-Line-Watcher. For users of Hayes compatible modems. Monitors the serial port and records all incoming calls. Allows a remote user to login, receive and leave a message, and transfer files via Zmodem in either direction. Two level DOS access, disabled DOS requestors and more. This is version 3.0, an update to version 2.8 on disk 372. New features include the ability to define external programs as menu options that can be executed by the remote user. Shareware, binary only. Author: Christian Fries	DMS	DISK-Masher is a utility that allows users to compress and archive entire floppy disks. Offers four different types of compression, extended virus checking of boot blocks, and data encryption. Requires at least 512K of memory. This is version 1.01, binary only. Author: SOS Software			
KeyMacro A keyboard macro program, configurable via a text file, that also supports hotkey program execution. You can map up to eight functions to each key, including keys such as cursor keys, the return key, etc. Version 1.6, an update to version 1.4 on disk 354, includes source. Author: Olaf Barthel	Fred Fish Disk 399	AutoCLI	A "PopCLI" type replacement that works with WorkBench 2.0. Also fixes the problem with PopCLI crashing the machine if used on a PAL Amiga to open a CLI window with a vertical size greater than 200 lines. Other features include an optional Function-key press with the qualifier to execute an SScript file. Version 1.6, binary only. Author: Nic Wilson	PrintStudio	Very nice intuition based general purpose print utility that prints text with a variety of options. Prints several graphic formats with yet more options. Print any part of a picture, print screens and windows, save screens and windows as IFF files, modify color palettes, change printing parameters and lots more! This is version 1.25, an update to version 1.2 on disk 366. Shareware, binary only. Author: Andreas Krebs	GruAwk	GNU awk is the GNU Project's implementation of the AWK programming language. It conforms to the definition and description of the language in The AWK Programming Language, by Aho, Kernighan, and Weinberger, with the additional features defined in the System V Release 4 version of UNIX awk. Version 2.10 beta, includes source. Author: Paul Rubin, Jay Fenison, Arnold Robbins, et al.		
	StdFile	A module that can be linked with any intuition based program to provide a standard file requester similar to the one in AmigaDOS 2.0. Even if you use the standard requester under 2.0, it is useful to have one available for use if you need to run on pre-2.0 systems. Includes source. Author: Jeff Lydett and Peter da Silva	Fred Fish Disk 407	DMouse	A versatile screen & mouse blinder, auto window activator, mouse accelerator, pop, pop window to front, push window to back, etc. widget. This is DMouse version 1.24, an update to version 1.20 on disk 258. Includes source. Author: Matt Dillon	GruGrep	The grep program from the GNU project. Replaces grep, egrep, and bmgrep. This is an update to version 1.5 on disk 295 and now handles AmigaDOS style wildcard specifications. Includes source. Author: Many (see README file)		
				MadBlacker	A cute screen blinder that bounces a transparent rectangle around on the screen, like a theater spotlight, with configurable options which allow size and whether or not you want the rectangle to change size. Version 2.00, includes source. Author: K. Mardam-Bey	PIM Publications, Inc.	P.O. Box 869 Fall River, MA 02722		
						AC is extremely interested in helping any Amiga user groups in non-commercial support for the Amiga.			

Name _____
 Address _____
 City _____ State _____ ZIP _____
 Charge my ☐ Visa ☐ MC # _____
 Expiration Date _____ Signature _____



Please circle to indicate this is a **New Subscription** or a **Renewal**

PROPER ADDRESS REQUIRED: In order to expedite and guarantee your order, all large Public Domain Software orders, as well as most Back issue orders, are shipped by United Parcel Service. UPS requires that all packages be addressed to a street address for correct delivery.
PAYMENTS BY CHECK: All payments made by check or money order must be in US funds drawn on a US bank.

One Year Of Amazing	Save over 49%	<input type="checkbox"/>	\$24.00 US
	12 monthly issues of the number one resource to the Commodore Amiga, <i>Amazing Computing</i> at a savings of over \$23.00 off the newsstand price!	<input type="checkbox"/>	\$44.00 Foreign Surface
		<input type="checkbox"/>	\$34.00 Canada and Mexico
One Year of AC SuperSub!	Save over 46%	<input type="checkbox"/>	\$36.00 US
	12 monthly issues of <i>Amazing Computing</i> PLUS <i>AC's GUIDE/AMIGA</i>	<input type="checkbox"/>	\$64.00 Foreign Surface
	2 Product Guides a year! A savings of \$31.30 off the newsstand price!	<input type="checkbox"/>	\$54.00 Canada and Mexico
Two Years Of Amazing	Save over 59%	<input type="checkbox"/>	\$38.00 US
	24 monthly issues of the number one resource to the Commodore Amiga, <i>Amazing Computing</i> at a savings of over \$56.80 off the newsstand price!		(sorry no foreign orders available at this frequency)
Two Years of AC SuperSub!	Save over 56%	<input type="checkbox"/>	\$59.00 US
	24 monthly issues of <i>Amazing Computing</i> PLUS <i>AC's GUIDE/AMIGA</i>		(sorry no foreign orders available at this frequency)
	4 Complete Product Guides! A savings of \$75.60 off the newsstand price!		

Please circle any additional choices below:

(Domestic and Foreign air mail rates available on request)

Back Issues: \$5.00 each US, \$6.00 each Canada and Mexico, \$7.00 each Foreign Surface.
 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 2.10
 2.11 2.12 3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 3.10 3.11 3.12 4.1 4.2 4.3 4.4 4.5
 4.6 4.7 4.8 4.9 4.10 4.11 4.12 5.1 5.2 5.3 5.4 5.5 5.6 5.7 5.8 5.9 5.10 5.11 5.12
Back Issue Volumes: Volume 1-\$19.95* Volume 2-\$29.95* Volume 3, 4, or 5-\$29.95* each
 *All volume orders must include postage and handling charges: \$4.00 each set US, \$7.50 each set Canada and Mexico, and \$10.00 each set for foreign surface orders. Air mail rates available.

Introducing: AC's TECH/AMIGA January 1991 Issue: \$14.95
 One-Year Subscription to AC's *TECH*—Four Issues!
Charter Rate: \$39.95 (limited time only)!

Freely Distributable Software:

Subscriber Special (yes, even the new ones!)

1 to 9 disks \$6.00 each
 10 to 49 disks \$5.00 each
 50 to 99 disks \$4.00 each
 100 or more disks \$3.00 each

\$7.00 each for non subscribers (three disk minimum on all foreign orders)

Amazing on Disk: AC#1...Source & Listings V3.8 & V3.9
 AC#3...Source & Listings V4.5 & V4.6
 AC#5...Source & Listings V4.9
 AC#7...Source & Listings V4.12 & V5.1
 AC#9...Source & Listings V5.4 & V5.5

AC#2...Source & Listings V4.3 & V4.4
 AC#4...Source & Listings V4.7 & V4.8
 AC#6...Source & Listings V4.10 & V4.11
 AC#8...Source & Listings V5.2 & 5.3
 AC#10...Source & Listings V5.6 & 5.7
 AC#11...Source & Listings V5.8, 5.9 & 5.10
 AC#12...Source & Listings V5.11, 5.12 & 6.1

InNOCKulation Disk: IN#1...Virus protection

Please list your Freely Redistributable Software selections below:

AC Disks _____
 (numbers 1 through 12)

AMICUS _____
 (numbers 1 through 26)

Fred Fish Disks _____
 (numbers 1 through 410; FF395 is currently unavailable. Please remember
 Fred Fish Disks 57, 80, & 87 have been removed from the collection)

Complete Today, or Telephone 1-800-345-3360

Subscription: \$ _____

Back Issues: \$ _____

AC's *TECH*: \$ _____

PDS Disks: \$ _____

Total: \$ _____

(subject to applicable sales tax)

Please complete this form and mail with check, money order or credit card information to:

P.i.M. Publications, Inc.
 P.O. Box 869
 Fall River, MA 02722-0869

Please allow 4 to 6 weeks for delivery of subscriptions in US.

And furthermore...

At the World Of Commodore Amiga in Toronto, Commodore gave the first public showing of CDTV. Heading this demonstration was Nolan Bushnell, General Manager of the Consumer Products Division at Commodore. AC had a chance to ask Mr. Bushnell his views on the introduction of this new, and very important Amiga component.

AC: Give us your view of CDTV.

Bushnell: CDTV is multimedia made affordable, and that is what I really love about it. I've always felt that the promise of computing is, in fact, the ability to have massive amounts of memory on-line to do

Nolan Bushnell presents CDTV to members of the press at WOCA.



graphics and sound and data manipulation. Not just for game-playing standpoints, but to give entertainments that have depth to them. I've always felt that one of the reasons that more adults don't play games is because there is not enough complexity, not enough information content, and not enough richness of environment. I believe that is one of the promises that CDTV gives us. And then, of course, in the educational field, the cost effectiveness is so important in the delivery platform: "eeks and squeaks", stickmen going across computer screens is not educational software, whereas the richness of being there...a generation of children that have been raised on *Sesame Street* want production values and we can give them all those kinds of things. CDTV has a richness of authoring tools and, so, relatively unsophisticated people are going to be able to write programs. My dream is that we can have tremendous leaps forward in education, I've said that the best one percent of the teachers are only being heard by one percent of the students. I want one percent of teachers to be heard by 100 percent of the students, and I think that can make a big difference.

The system, in its simplicity and in the things all Amiga people know and love, all of a sudden can be put in the hands of the masses, and so it gives the people a tremendous publishing menu. I mean CD-ROM disks are so cheap to manufacture that, once they are pressed, the cost of distribution becomes almost non-important. So there [are] going to be some CDTV millionaires created in developing software in the next few years. Who knows who they are going to be, but the opportunities are clearly going to be there. I see that once this unit gets into a million American homes (a tremendous amount of software that is currently written for the Amiga [is] so superior to what's available on Nintendo or [in the] DOS world or what have you), [it] is going to bring the economic extremist back to light about some of those older products as well. I just really think the opportunity is awesome. I think it is going to be for the bold to take hold of it and really make it sing. After all, hardware platforms [are] no good without good software. But now we've gotten a new arrow in the quiver. Think of 28 hours of audio intermixed with graphics. [The] mind boggles. Who knows what kind of rich story you might learn, what kind of interesting branching algorithms can be created. All these things and more will be available very, very shortly.

AC: Can we also see this in business as a training tool?

Bushnell: Absolutely, the business applications, of course, are legend. More and more the employers are taking on the burden of training the employee. More and more we are finding that the burden of rudimentary skills—reading, writing, arithmetic—are falling on the employer. This is going to give him an opportunity to stop that gap. A lot of the training systems up to date either require a group, a teacher, or a relatively expensive system, so you're talking about maybe once a month or once a year training. We believe CDTV systems can be cheap enough that they can be scattered throughout the workplace so that the training and operation become almost seamless...so that people train themselves before every coffee break on a different aspect of a particular function. You see that the point of sale is terrifically important. As the sales cycle for many items

become more and more complex, the skill of the salesperson needs to be greater. I'm not even sure that that's going to happen but at least we can put at point of sale an ability for a customer to be trained or to be taught some of the feature benefits so that a new form of advertising I think is going to be very important, and it is really training advertising. What is this unit? And then once I've decided to buy it maybe I can stay there a little bit and know how to set it up...So that if we have a better way of training, if we have a better way to train, if we have a better way to teach, if we have a better way to communicate, we can use this thing to make everybody's life a richer, more interesting experience.

AC: What about military applications?

Bushnell: Military, of course, is a very important feature. The military spends literally billions of dollars on training. The high-tech army is not something that you could do trivially and, so, to put these systems throughout the military is almost a forgone conclusion.

AC: Anything else you want to add?

Bushnell: What we are really trying to do is to make multimedia a reality and I think we've done that.

AC: A lot of this goes into AmigaVision—how it can be utilized in this and how you can have a large database on CD utilizing the components of both AmigaVision and the CD to actually produce a tremendous number of different things not only in entertainment, training, and education.

Bushnell: We're standing on some very, very strong foundations.

AC: And when will we see CDTV in the states?

Bushnell: February 15th in quantity. It's going to be a regional roll-out and so probably won't quite make it into Canada until Spring.

AC: So unlike the 286LT that they announced up here and sold up here first, we'll actually get CDTV first.

Bushnell: CDTV will probably be in California slightly before because we want to fine tune some marketing plans.

•AC•

3 THREE NEW PRODUCTS FROM ICD

Flicker Free Video™

With *Flicker Free Video* (FFV) and a standard VGA or multi-frequency monitor, any Amiga® 500, 1000, or 2000 computer can produce a high quality display, free of interlace flicker and visible scan lines. Installation requires no soldering or advanced technical knowledge and frees the video slot in Amiga 2000 computers for other uses. *FFV* is compatible with all software, works in low and high resolutions interlaced or not, and has no genlock conflicts. *FFV* uses a multi-layer circuit board and surface-mounted components, packing a lot of power into a very small space. Both PAL and NTSC are automatically recognized and fully supported. Full overscan is supported, not just a limited overscan. Three megabits of random access memory are used to ensure compatibility with overscan screens as large as the Amiga can produce.

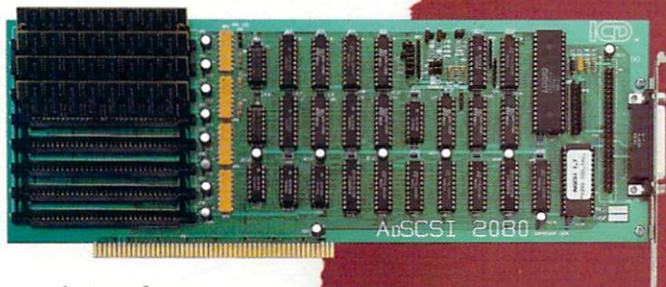
AdSpeed™

ICD expands its line of innovative enhancement products for the Amiga with the introduction of *AdSpeed*, a full featured 14.3 MHz 68000 accelerator for *all* 68000-based Amiga computers. *AdSpeed* differs from other accelerators by using an intelligent 16K static RAM cache to allow zero wait state execution of many operations at twice the regular speed. *All* programs will show improvement. *AdSpeed* will make your Amiga run faster than any 68000 or 68020 accelerator without on-board RAM. *AdSpeed* works with all 68000 based Amiga computers, including the 500, 1000, and 2000. Installation is simple and requires no soldering. *AdSpeed* has a software selectable true 7.16 MHz 68000 mode for 100% compatibility — your computer will run as if the stock CPU was installed. 32K of high speed static RAM is used for 16K of data/instruction cache and 16K of cache tag memory. A full read and write-through cache provides maximum speed.



AdSCSI™ 2080

The fastest, most versatile SCSI host adapter (hard drive interface) available for the Amiga 2000 now comes in a new configuration. *AdSCSI 2080* is *not* DMA, but its clean design and advanced caching driver provide greater throughput than any available DMA interface. All the features you want are included at no additional charge: autoboot from Fast File System partitions, Commodore® CSIDirect and Rigid Disk Block conformance for no mountlist editing and compatibility with third party SCSI devices, and the most advanced removable media support available, including automatic DiskChange and no partitioning restrictions. *AdSCSI 2080* also includes sockets for adding two, four, six, or eight megabytes of RAM using 1 megabyte SIMMs. If expansion slots are in high demand, then this card could be your answer.



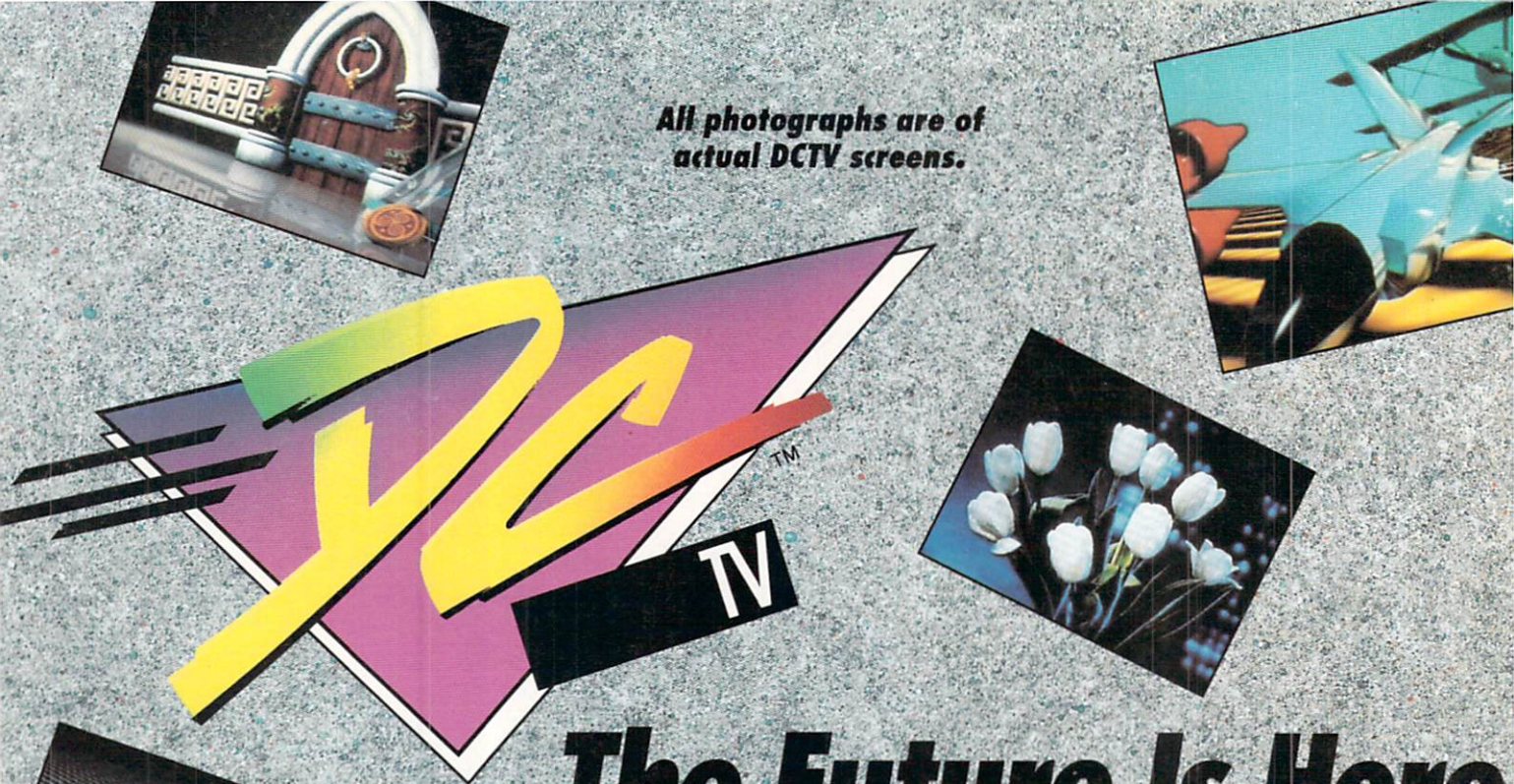
Flicker Free Video, *AdSpeed*, and *AdSCSI 2080* join ICD's existing and growing line of power peripherals and enhancements for Amiga computers. Our experience and expertise allow us to give you the products and support you deserve. From beginning to end, every possible aspect of product development and production is handled in-house. We design all the hardware, lay out all the circuit boards, and write all the software. We assemble and test our products in our own facility, providing us with an unmatched level of control over the finished product. It is never out of our hands. These are more examples of the advantages you get from ICD. The best product. At the best price. With the best support. No compromises.

Flicker Free Video, *FFV*, *AdSpeed* and *AdSCSI* are trademarks of ICD, Inc. Commodore is a registered trademark of Commodore Electronics Limited. Amiga is a registered trademark of Commodore-Amiga, Inc.



1220 Rock Street
Rockford, IL 61101
(815) 968-2228 Information
(800) 373-7700 Orders only
(815) 968-6888 FAX

*All photographs are of
actual DCTV screens.*



The Future Is Here

- ▲ Paint, digitize and display full color NTSC video graphics on any Amiga®.*
- ▲ Capture a video frame in 10 seconds from any color video camera. (Also works with still video cameras, video disk and still frame capable VCR's.)
- ▲ Display and capture full color 24 bit high resolution images.
- ▲ Convert DCTV™ images to or from any IFF display format (including HAM and 24 bit).
- ▲ Paint, digitize and conversion software are all included.
- ▲ Works with all popular 3D programs.
- ▲ Animate in full NTSC color.

\$495

** Min. 1 Meg. required*

DCTV™ (Digital Composite Television) is a revolutionary new video display and digitizing system for the Amiga. Using the Amiga's chip memory as its frame buffer memory, DCTV™ creates a full color NTSC display with all the color and resolution of television. Sophisticated true color video paint, digitizing and image processing software are all combined into one easy to use package included with DCTV™. DCTV™ also works with all popular 3D programs to create full color animations that can be played back in real time.

DIGITAL

C R E A T I O N S

2865 Sunrise Boulevard Suite 103 Rancho Cordova CA 95742 Telephone 916/344-4825 FAX 916/635-0475

©1990 Digital Creations. Amiga is a registered trademark of Commodore Business Machines. Patents applied for.
Circle 163 on Reader Service card.